TATSUNO EUROPE a.s.

COMBINED DISPENSERS OCEAN EURO

Installation and User Manual

BMP 4000

OCEAN

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INTRODUCTION

This manual is for users of combined TATSUNO OCEAN EURO dispensers as well as for designer studios who design fuel stations. The company TATSUNO recommends thorough studying of the manual, including all of its appendices. The manual must be available to the dispenser operators during installation and regular maintenance of dispensers.

- Keep this manual along with its appendices over the whole life time of the dispenser
- Make it available to other owners and users as well
- Perform updates of regulations – see http://www.tatsuno-europe.com/_en/download/

The appendices properly reflect reality at the time of publishing. The producer reserves the right to change technical conditions of the equipment or its attributes without written notice, due to continuous development and improvements.

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1. INTRODUCTORY INFORMATION

Symbols used in this manual:

Warning

Explosion hazard

Beware – electric appliance

No smoking

No open fires

No mobile phones

Terms used in this manual requiring special attention:

CAUTION *The violation of these conditions may create conditions that lead to injury or death of persons or to substantial damage to property.*

WARNING *The violation of these conditions may lead to injury of persons and/or damage to the dispenser.*

NOTICE *This text informs about legal and/or statutory requirements concerning the installation and use of the dispenser. Violation of these requirements may create a hazardous situation and/or lead to damage of the dispenser.*

NOTE *This text informs about installation procedures, techniques and operation methods etc., which are important for securing proper installation and correct operation of the dispenser and which, if violated, may lead to damage, failure or bad performance of the dispenser.*

WARNING->LPG *Warning concerning only combined dispensers with LPG delivery module.*

NOTICE->WSE *Notice concerning only combined dispensers with WSE delivery module.*

NOTE->ADBLUE *Note concerning only combined dispensers with AdBlue® delivery module.*

1.1. STUDY THE MANUAL FIRST

Before installation or operation of the dispenser, first study the relevant parts of the Installation and User Manual. Consider all the hazards, warnings and notes in the manual.

The producer provides this Installation and User Manual in order to present all the necessary information and instructions for full and efficient installation, use and maintenance of our combined dispensers of the OCEAN EURO type series.

This manual was created by the producer and forms an inseparable part of the dispenser accessories.

The use of this manual is done at the full responsibility of the user; any operations not described here must be considered forbidden. Any operator who performs such operations will take all responsibility for the results of such actions.

The manual is organized into individual sections, which have their subsections, so each topic is independent and also corresponds to operational logic (learn – prepare – use – maintain).

The manual properly reflects the technical situation at the moment of sale of the dispenser and it cannot be deemed inadequate as a result of any subsequent changes and updates according to the latest circumstances.

NOTICE *Keep this manual and enclosed documents over the whole service life of the appliance for future reference!*

1.2. AUTHORIZED USE

The combined dispensers of the OCEAN EURO series are intended for stationary use for dispensing of gasoline, motor diesel, biodiesel, light fuel oils, kerosene and ethanol-gasoline mixtures (max. E85), the AdBlue® additive, liquefied petroleum gas (LPG) and motor vehicle windshield washer fluid (WSE) in specified quantities from the storage tank into motor vehicles.

ATTENTION *The dispenser is a complicated appliance that carries out a number demanding functions.* ***Before commissioning, the tanks and pipes must therefore be cleaned and the cleanliness of the fuel must be verified (dirty filters in the dispenser cannot be considered as a reason for warranty repairs!). Before commissioning, the electrical wiring and proper connections must be reviewed to prevent electric shock injury and to ensure explosion protection (the fuel is class I flammable material).***

NOTICE ***Any changes to the dispenser may revoke the validity of the device certification. See the certification documents and the manufacturer's instructions every time when considering any modification of the electrical wiring and/or the whole device.***

Every fuel dispenser is tested at the production plant concerning its function, safety and metrology. The delivery of each fuel dispenser includes certificates which the producer must provide to relevant authorities upon request.

1.3. BRIEF CHARACTERISTICS OF THE USED MEDIUMS

1.3.1. CHARACTERISTICS OF LPG

LPG is the trade name for a liquefied mixture of light carbohydrates (**L**iquefied **P**etroleum **G**as), mainly with three to four atoms of carbon in a molecule. LPG is harvested in synthetic production of gasoline and lately also in the processing of natural gas. LPG is a colorless, easily volatile liquid with a specific odor.

After releasing the overpressure, LPG evaporates quickly and produces a flammable gas approximately twice as heavy as air. Evaporating 1 m^3 of LPG (approx. 550 kg) into the air results, after the gas dilution into the lower explosion limit, in about 12.400 ÷ 83.330 m^3 of an explosive mixture heavier than air that cumulates on the ground.

Table 1 – Physical properties of the main components of an LPG mixture

Physical properties in liquid state	**propane**	**butane**
formula	C_3H_8	C_4H_{10}
molecule mass	44,09	58,12
boiling point (°C)	-42,6	-0,6
density (kg/m^3 at 20°C)	502	579
Physical properties in gaseous state		
density (kg/m^3 at atmospheric pressure)	1,865	2,76
consistency (air = 1)	1,562	2,091
calorific value (MJ/m^3 at 0°C and atmospheric pressure)	93,57	123,76
Explosion limit in air mixture in % of volume		
lower	1,7	1,3
upper	10,9	9,3
ignition temperature in °C	465	365

The physical properties of the LPG mixture are within the scope of the properties of its individual constituents. Liquid LPG has similar properties to gasoline, i.e. dissolves and dries seals made of natural rubber, organic lubricants, varnish and other related substances. In contrast, some of the substances that withstand the effects of LPG are synthetic rubber, graphite plugs, Teflon material etc. For sealing threaded connections for both liquid and gaseous LPG the used material is Teflon tape or the LOCTITE mixture. Usage of sealing fillers or fillers made of lampblack (HERMETIC, HERMOSAL) results in the connections being difficult to dismantle. For connections with flanges, the suitable sealing rings are made of Teflon or Klingerit suitable for LPG.

Gaseous LPG has a slight narcotic effect on the human organism. After a certain amount of time, inhaling gaseous LPG causes headaches, nausea, dizziness, reduced attention, and drowsiness. Unless it leads to a fire and burns of the victim, gaseous LPG can cause the suffocation of workers, even though it isn't directly poisonous, unlike for example coal gas. Because it is heavier than air, it cumulates on the ground and in hollows and a lying unconscious person (as a result of injury etc.) may be in an unbreathable atmosphere. Gaseous LPG further causes degreasing of the skin.

In case of a sharp decrease in pressure to atmospheric pressure (e.g. in case of an LPG leak from the device), LPG vaporizes at the temperature of -42°C, so in case of contact with skin it causes frostbite.

1.3.2. CHARACTERISTICS OF ADBLUE®

AdBlue® is a 32,5% solution of urea, water and some additives. This mixture was chosen because it is has the lowest crystallization temperature. To ensure correct operation of the SCR over its lifetime, AdBlue® quality needs strict control and is therefore specified in a standard (DIN 70070). Further physical properties of AdBlue®:

- AdBlue® freezes at -11°C
- AdBlue® is highly corrosive because 67.5% is water
- AdBlue® shows strong crystallization and creep

Note: ***Legislation and Selective Catalytic Reduction (SCR) technology.*** *All vehicles above 3.5 tonnes fall into the class of heavy duty and are subject to new heavy duty regulations. These regulations set maximum emission values for PM and NOx. In order to comply with new European regulations EURO IV and EURO V, European manufacturers of trucks are forced to implement new technologies.* ***Selective Catalytic Reduction*** *(SCR) technology involves the destruction of NOx through reaction with ammonia, resulting in harmless water and nitrogen. The urea solution required by the SCR system is called* ***AdBlue®****. It is stored in a tank on the vehicle and injected in the exhaust system where the reaction takes place. To meet Euro IV, expected AdBlue® consumption is around 5% of the diesel consumption, requiring tank sizes varying from 50 l to 100 l. For Euro V, this consumption is expected at 6-7%.*

1.3.3. CHARACTERISTICS OF WINDSHIELD WIPER FLUID – WSE

Windshield wiper fluid for motor vehicles (WSE) is a solution of **Water & Soap & Ethanol**. The percentage of the individual components in the medium varies. The maximum percentage of ethanol in the medium is limited to 85%.

ATTENTION ***It is forbidden to use the dispenser for dispensing a medium with an ethanol percentage higher than 85%!***

1.4. HEALTH AND SAFETY

1.4.1. SAFETY CHECKLIST

- Any smell of gasoline, LPG or ammonia (AdBlue®) must be reported immediately.
- It is obligatory that this checklist be fully complied with during all work at the filling station, especially during construction or repair work.
- It is the duty of the contractor to ensure that all workers employed by him obey each and all of the relevant laws, directives and other regulations.
- All fuels and LPG, WSE and AdBlue® liquids must only be stored in storage tanks compatible with these liquids.

Areas requiring special caution

- The insides of tanks, tubes, dome shafts, filling shafts, change over shafts, vessels and dispensers.
- All areas with a probability of accumulation of fuel, LPG or AdBlue® vapors, which are heavier than air, e.g. draining shafts, low elevation rooms, cellars, excavations etc.
- Areas around outlets of tank ventilation pipes, especially during the filling phase.

- Any areas near dispensers, truck tanks and other vehicles while they are being filled, especially when there is a lack of wind.
- A radius of 1 meter around fuel leading pipes and pipes containing vapor.
- Silt traps.

1.4.2. DUTIES OF EMPLOYEES

- To ensure optimal accident prevention, in addition to general rules applying to worker's protection, it is necessary to take into account all national protection of workers legislation and to actively support all measures which enhance safety standards.
- It is each employee's duty to follow all company directives regarding the prevention of accidents, unless such directives are proved to be unfounded.
- Employees should not follow any instructions that go against safety standards.
- Employees are only permitted to use equipment for its original purpose, which is defined by the company alone.
- If an employee detects equipment that is deficient in terms of safety, he shall eliminate this deficiency immediately. If such safety rectification is not part of his defined area of activities, or if his knowledge is insufficient to carry out such work he must immediately inform his superior about the detected safety deficiency.

The same also applies to the following:

1) **Work Materials** that have not been correctly packed or correctly marked in order to meet safety requirements.
2) **Work Methods** and **Work Processes** that have not been correctly coordinated or controlled in order to meet safety requirements.
3) **Where dangerous activities are carried out by several persons**, it is necessary to maintain a permanent faultless communication between them in order to avoid dangerous events. This requires appointing one person to carry out overall supervision.

1.4.3. HAZARDS

Prior to starting work, the dispenser must be isolated (i.e. entirely disconnected from the main supply) and the main supply switch locked in the OFF position. The submerged pump (if applicable) and control signals from the dispenser must also be isolated. This is done to provide safety for the technician. As a further precaution, switch off the main supply in the service station shop and place a clear notice on the switch to avoid it being turned on again inadvertently. It is not permitted to put an AdBlue® dispenser into operation before an authorized official has inspected it and released it. This depends upon the national regulations in force. Dismantled packaging and cladding must be stored in such a way as to avoid damage to components or injuries to persons. Covers that can be opened, such as the counter housing, should be handled with care. Ensure that the retaining catch is placed in the correct position to prevent the cover falling onto the head of service engineers or other persons in the area.

At unattended service stations, every end-user should have access to the User Instructions. They should be visible on a notice board or integrated into the DIT and should be sufficiently well lit so that they can be read at night. At unattended service stations break away couplings must always be used to reduce the danger caused by a motorist driving off with the nozzle still in the tank.

WARNING ***Connecting and disconnecting electrical equipment may only be carried out by qualified personnel authorized for such tasks. Work in dangerous areas must be secured by adherence to all national safety requirements in force.***

1.4.4. PERSONAL PROTECTIVE EQUIPMENT

Protective Clothing

The following clothing should be worn **at all times** during installation and maintenance procedures:

- Protective helmet.
- Protective shoes (conductive).
- Protective gloves and/or protective hand cream.
- Anti static clothing.
- Eye protection.

Safety equipment for working in hazardous areas

The following safety equipment is required for working in hazardous areas:

- Only spark free tools are permitted for work on dispensers.
- Work on bearings is only permitted using the standard workshop tools authorized for this kind of work.
- The use of all electrical tools is strictly prohibited.
- Only the use of explosion protected work lights is permitted.
- The use of telecommunications equipment in hazardous areas is strictly prohibited.

Safety instructions

The following safety instructions must be adhered to during installation and maintenance procedures:

- Inhalation of AdBlue® vapor must be avoided. Suitable precautions must be taken and, where necessary, respirators used.
- Avoid direct contact of AdBlue® with the skin.
- Use suitable protective clothing, protective gloves and/or protective hand cream.
- Avoid AdBlue® spills.
- No smoking, no naked flames are permitted.
- Long hair and ties can get caught in moving parts. Hair must be suitably covered.

1.4.5. FIRST AID PROCEDURES

Safety Data Sheets for all products should be available at the service station. These sheets contain important health and safety information relating to the individual product, especially AdBlue®, its inhalation or ingestion.

Administering First Aid after Contact with AdBlue®

AdBlue® is a clear liquid with little or no odor making leakages difficult to detect. After a period of time the odor may change to a strong ammonia stench. Decomposition on heating may produce toxic fumes of carbon monoxide, carbon dioxide, nitrogen oxide and ammonia reducing the amount of oxygen in the air.

In the event of personal contact with AdBlue®, the following procedures should be carried out

Eye injuries

If the eyes have come into contact with AdBlue®:

- Pour copious amounts of water over the eyes immediately.
- Rinse eyes thoroughly by keeping eyes open and eyelids away from eyes.
- Continue to rinse the eyes with fresh running water for at least fifteen minutes.
- Removal of contact lenses after an eye injury must be undertaken by trained personnel.
- Seek medical advice if irritation continues.

Skin contact (burns)

If the skin has come into contact with AdBlue®:

- Immediately cool affected skin with cold water over the affected area.
- Carefully remove all clothing which has been in contact with AdBlue®.
- Continue to rinse the affected area with ample water for at least fifteen minutes.
- Apply antiseptic bandages to the affected areas.
- Seek medical advice if irritation continues.

Inhalation (of AdBlue® liquid/ammonia/biuret)

Do not enter the danger zone without adequate protection including respiratory mask and/or aforementioned protective clothing. If any toxic fumes have been inhaled:

- If possible, remove the person out of the contaminated area into fresh air.
- Lay the person down and loosen their clothing, keep warm and rested.
- If the person is unconscious, place them in the recovery position.
- If necessary, trained personnel should apply oxygen or artificial respiration to the person.
- Call for medical assistance if breathing difficulties continue.

Ingestion

If AdBlue® liquid has been ingested:

- Do NOT induce vomiting.
- If vomiting occurs, lean person forward to maintain open airway and prevent aspiration.
- Rinse out mouth with water before trying to ingest a comfortable amount.
- Seek medical advice if large amounts have been ingested or if irritation continues.

Administering First Aid after Contact with LPG

- **Poisoning – gaseous LPG**
  When refueling, avoid LPG vapor inhalation – danger of suffocation. In case of injury, the afflicted person must be taken out of the contaminated area. Attention! Fire and explosion hazard! LPG is not poisonous, but it is suffocating. In case of breathing failure carry out mouth-to-mouth resuscitation immediately, in case of blood circulation failure combine mouth-to-mouth resuscitation with an indirect heart massage. Transfer the affected person to a medical facility without delay.
  Frostbite – liquid LPG
  During a rapid drop of pressure to atmospheric pressure, liquid LPG evaporates at the temperature of -42°C. If it comes into contact with skin, e.g. during a liquid LPG spill, frostbite may occur. Do not rub the affected area; cover it with a sterile bandage and seek medical assistance.
  In case LPG enters the eyes, rinse them with copious amounts of water and seek medical attention.
- **Burns – fire**
  In case of a burn, cool the wound with cold water, do not rub, cover with a sterile bandage and secure medical assistance. Do not remove clothing. In case of burning clothes, do not run; but douse with water, put the fire out with a blanket etc., or stop, drop and roll.

1.4.6. STORAGE OF ADBLUE®

- AdBlue® liquid will crystallize at low temperatures; at elevated temperatures (above 50°C) it can form biuret and ammonia. Always store AdBlue® liquid away from sources of heat or fire in AdBlue® compatible containers in segregated, approved and labeled areas.
- Store away from incompatible materials and avoid contact with strong oxidizers, acids, alkalis, nitrates, sodium or calcium hypochlorite which can react with AdBlue® to form a potentially explosive mixture. Do not store for long periods (over six months).
- Ensure the container is securely sealed, protected against physical damage and checked regularly for leaks. If a third party tank/container for the supply of AdBlue® is installed on the service station, refer to the manufacturer's recommendations for filling, emptying, cleaning, handling and storage of the tank/container unit.

1.4.7. ADBLUE® SPILLAGE

Although classified as non-hazardous, AdBlue® liquid, when spilt, will form crystals and creep. If left unattended, this will create a slippery surface. All spillages of AdBlue® liquid must be reported immediately to the Station Manager.

Avoid breathing vapors and contact with skin and eyes by use of personal protective equipment.

AdBlue® spillage on the forecourt:

- Liberally cover the spillage with sand, earth or other inert, absorbent material.
- For larger spills, contain the spill with sand or earth and prevent spillage from entering drains or surface waterways.

NOTE ***Do not release AdBlue® into surface water and do not empty into drains!***

- When dry, transfer into a suitable container for controlled disposal.
- If AdBlue® is leaked into the drainage system, flush liberally with plenty of water.
- Apply prevailing national/local regulations for waste disposal.

AdBlue® in dispenser/vehicle:

- Use a soft cloth and water to remove small AdBlue® spillages on the dispenser/vehicle.

WARNING ***Risk of electrical shock! Never use a hose or high-pressure spray near an AdBlue® dispenser!***

2. OCEAN EURO LINE COMBINED DISPENSERS

2.1. DISPENSER DESCRIPTION

OCEAN EURO combined dispensers serve for pumping of liquid fuels and oil, ethanol and petrol mixtures (maximum E85), the AdBlue® additive, liquefied propane-butane (LPG) and windshield wiper fluid (WSE) into vehicles and for commercial purposes. The OCEAN EURO combined dispensers consist of two parts – an OCEAN EURO dispenser for fuel dispensing (gasoline, diesel, E85…) and an additional module for LPG, AdBlue® or WSE (windshield wiper fluid) dispensing.

OCEAN EURO dispensers for fuel dispensing are equipped with high quality Japanese hydraulics made by the TATSUNO Corporation (also referred to as TATSUNO) and an efficient and reliable electronic counter of the Czech company TATSUNO EUROPE. All fuel dispensers can operate in the manual mode (individually, off-line) or in the automated mode, remotely controlled from the fuel station kiosk and connected to the cash desk (POS) via a data line. Fuel dispensers of the OCEAN EURO series have their enclosure (cover, door, lid etc.) made of a varnished steel sheet, stainless metal sheet or non-flammable laminate approved for this use by the state testing authority (Statement of FTZÚ 04ST 0083). The supporting elements of the dispenser framework are made of varnished steel sheets of 0.8 - 2.5 mm thickness or of stainless metal sheet. The standard color of the OCEAN dispensers is white. Every dispenser is equipped with hydraulics (pumping mono block + piston measuring transducer) of the Japanese company TATSUNO Corporation. It is a worldwide-proven type of hydraulics with a high reliability and a long service life. The pumping monoblock is equipped with an intake and output filter, a gas and vapor separator, a check valve, and a rotation pump capable of operation pressure regulation. The four piston measuring transducer can be regulated by adjusting of a single piston. Each measuring transducer includes a highly reliable explosion-proof pulse generator. Each fuel dispenser has a highly reliable explosion-proof electronic counter with own diagnostics and displays, showing the pumped amount in various currency units, fuel quantity in liters and the fuel unit price in currency unit per liters. Displays of dispensers for non-public sale show only pumped fuel quantity in liters. The dispenser hoses are made of high quality petrol-resistant rubber with antistatic protection. As a standard, the dispensers are delivered with an automated stop-nozzle. As a standard, dispensers are supplied with delivery hose retractors and automatic delivery stop-nozzles. The standard color of TATSUNO EUROPE dispensers is white (RAL9016) with a black dispenser base (RAL9005).

AdBlue® dispenser modules have their enclosure (cover, door, lid etc.) made of a varnished steel sheet and a stainless metal sheet. Each AdBlue® module is equipped with a piston flow meter of the Japanese company TATSUNO, type FM-1022. This is a variation on the standard fuel meter in a more chemically resistant model (inside stainless steel parts + outside surface treatment). The TATSUNO pulser (pulse generator) is installed on the piston meter. The measuring unit consists of the meter itself, a filter and a controlling electromagnetic valve made of stainless steel. The dispensed medium passes through the filter, meter and controlling valve, is led into the hose and through the sight glass (optional) into the nozzle, from where it is delivered into the AdBlue® tank of the vehicle. The dispensing hoses are made of quality chemically resistant rubber in antistatic model (the same type of hose as is used for LPG). AdBlue® dispensing modules are as a standard supplied with delivery hose retractors and automatic AdBlue® stop-nozzles. The whole interior of the AdBlue® dispensing module is heated to prevent the temperature inside the module from dropping under 0°C.

Windshield wiper fluid (WSE) dispensing modules have their enclosure (door, covers) made of a varnished stainless metal sheet. Each WSE module is fitted with a piston flow meter of the Japanese company TATSUNO, type FM-1022 – see the AdBlue® dispensing module. The TATSUNO pulser (pulse generator) is installed on the piston meter. The measuring unit consists of the meter itself, a filter and a controlling electromagnetic valve made of stainless steel. The dispensed medium passes through the filter, meter and controlling valve, is led into the hose and through the sight glass (optional) into the nozzle, from where it is delivered into the windshield wiper fluid tank of the vehicle. The free-hanging spiral dispensing hoses are made of quality chemically resistant rubber in antistatic model and end in stainless steel delivery nozzles.

Liquefied Petroleum Gas (LPG) delivery modules are fitted with TATSUNO hydraulics. It is a worldwide-proven type of hydraulics with a high reliability and a long service life. A two-channel pulse generator TATSUNO is fitted on the piston meter. In the lower part of the module's hydraulics on the meter console there is a measuring device consisting of the meter, a filter, a separator, a check valve for the liquid phase and a safety valve of the gaseous phase. The safety valve is adjusted to the pressure of 1.8 MPa and prevents exceeding the max. operational pressure by letting the liquid phase back into the storage tank. The outlet of the meter contains a TATSUNO differential valve that keeps the medium in the meter in the liquid phase. This is a result of the gradual evening out of pressures after the beginning of dispensing. The measuring device inlet is fitted with a closing ball valve G ¾". The pumped medium progresses through the meter, the differential valve and a sight glass, a breakaway safety coupling, into the dispensing hose and through the dispensing hose into the fuel tank of the vehicle. Any gas phase constituents are separated in the separator and are returned through the check valve into the return pipe (DN 16), which is connected to the storage tank. A ball valve G ½" is part of the return piping. The filling pressure can be checked on the manometer located under the nozzle hanger. The pumped medium (LPG) is delivered by a pump placed outside the fuel dispenser area; it flows through a safety electromagnetic valve (if installed), through the ball valve and filter into the separator. If the medium comprises gaseous constituents, they are separated and returned from the top part of the separator by the return piping, which has to be opened if the dispenser is running, back to the storage tank. The ID of the return piping must be DN 16. The zone of the gaseous differential valve phase is connected with the return piping. From the separator the liquid flows via a return valve into the piston meter and flows through the differential valve and the sight glass with the break-through coupling into the dispensing hose and nozzle.

The main advantages of the OCEAN combined dispensers are:

- high performance and ensured quality
- High variability – a low-cost basic version can, through the addition of a wide range of accessories and additional modules, be turned into a comfortable dispenser with a personalized design
- Easy maintenance and service – simple construction
- possibility for temperature compensation of the dispensed medium to the reference temperature 15°C (20°C)
- wide temperature range of operation (-20°C / +40°C)
- controlled vapor recovery with possibility for monitoring its functionality and dispenser blocking in case of malfunction of the vacuum pumps (vapor flow sensors)

- control of dispensing by proportional electromagnetic valves +24Vss with possible continuous regulation of maximum flow rate Q_{max}.

2.2. CERTIFICATES AND APPROVALS

OCEAN EURO combined dispensers are in conformity with all European regulations related to metrology and safety.

2.2.1. METROLOGY

The appliance has been certified by the Czech Metrology Institute in Brno, notified body No. 1383. The assessment of appliance conformity used the procedure "B" (type testing) + "D" (ensuring production quality) according to government decree No. 464/2005 Coll., which sets technical requirements for measuring apparatuses and implements in the Czech Republic the directive of the European Parliament and European Council No. 2004/22/ES. A new **ES type certificate (MID certificate)** has been issued for:

- fuel dispensers (gasoline, diesel, biodiesel, ethanol and their mixtures), TCM No. 141/07-4491,
- LPG dispensers and modules, TCM No. 141/07-4493,
- AdBlue® dispensers and modules, TCM No. 141/07-4492, and
- WSE dispensers and modules, TCM No. 141/13-5085.

Type tests were carried out in accordance with OIML R117-1, OIML R118 and OIML D11.

The company TATSUNO EUROPE a. s. received a **Certificate of the Quality Management System No.** 0119-SJ-C006-07 from the Czech Metrology Institute and thus met the requirement of qualification for declarations of conformity of type, based on ensuring measuring apparatus production quality according to attachment No. 2, procedure "D" (Chapter 6) of the government decree No. 464/2005 Coll. The validity of the certificate is reviewed by audits in one-year intervals.

2.2.2. SAFETY

The dispensers have been certified by the authorized entity No. 210 – The Physics-Technical Testing Institute in Ostrava – Radvanice, notified body No. 1026, for the use in areas with an explosion hazard according to the directive 94/9/ES. The fuel dispensers are confirmed to comply with the European norm on the construction of fuel dispensers no. EN 13617-1. A new **ES type certificate (ATEX certificate)** for fuel dispensers No. FTZÚ 14 ATEX 0065X has been issued. All parts of dispensers located in areas with an explosion hazard comply with the European directive ATEX no. 94/9/ES.

The company TATSUNO EUROPE a. s. has received an **Acknowledgement of quality insurance** No. FTZÚ 02 ATEX Q030 from the Physical Technical Testing Institute in Ostrava – Radvanice for fuel dispensers and accessories. The validity of this certificate is reviewed by audits on a yearly basis.

2.2.3. ELECTROMAGENTIC COMPATIBILITY (EMC)

The dispensers have been tested by the Czech Metrology Institute in Brno, notified body No. 1383. The assessment of appliance conformity was carried out according to the directive of the European Parliament and European Council No. 2004/108/ES and in accordance with OIML R117-1, OIML R118.

2.3. BASIC TECHNICAL DATA

2.3.1. HYDRAULIC UNIT OF FUEL DISPENSERS

Fuel dispensers

Pumping output:	- standard	40 L/min (30 – 50 L/min)
	- increased /H	80 L/min (70 – 90 L/min)
	- very high /UH	130 L/min (120 – 150 L/min), when using piston meter
		150 L/min (140 – 170 L/min), when using LOBE meter
Accuracy class:		0.5%
Minimum flow rate and volume (Q_{min}; MMQ):		5 L/min; 2L (at Q_{max} = 50 L/min)
		5 L/min; 5L (at Q_{max} = 80 L/min)
		10 L/min; 10L (at Q_{max} = 120 – 170 L/min)
Type of dispensed liquid:		gasoline, motor diesel, biodiesel, gasoline x ethanol mixture (max. E85), oils with dynamic viscosity range 0.5 – 10 mPa.s (0.5 – 10 cp)
Maximum operating pressure:		0.18 MPa (1.8bar); 0.25 MPa (2.5bar) for /H or /UH
Electromotor of the pump:		three phase, 3x400V; 0.75 kW; 1395 RPM
Solenoid valves:		+24VDC / max.1A

LPG dispensing modules

Pumping output:	50 L/min
Minimum flow rate and volume (Q_{min}; MMQ):	5 L/min; 5L (at Q_{max} = 50 L/min)
Type of dispensed liquid:	LPG, liquefied propane-butane
Accuracy class:	1.0%
Maximum operating pressure:	1.8 MPa (18 bar)
Minimum operating pressure:	0.7 MPa (7 bar)
Solenoid valves:	two-stage ON/OFF +24VDC/max. 1A

AdBlue® dispensing modules

Pumping output:	40 L/min
Accuracy class:	0.5%
Minimum flow rate and volume (Q_{min}; MMQ):	4 L/min; 2L (at Q_{max} = 40 L/min)
Type of dispensed liquid:	AdBlue® – 32.5% urea solution according to DIN 70070
Maximum recommended operating pressure:	0.25 MPa (2.5bar)
Minimum operating pressure:	0.1 MPa (1 bar)
Solenoid valves:	proportional +24VDC / max.1A

WSE dispensing modules

Pumping output:	20 L/min
Accuracy class:	0.5%
Minimum flow rate and volume (Q_{min}; MMQ):	2 L/min; 2L (at Q_{max} = 20 L/min)
Type of dispensed liquid:	water, soap and ethanol mix (max. ethanol volume 85%)
Maximum recommended operating pressure:	0.25 MPa (2.5bar)
Minimum operating pressure:	0.1 MPa (1 bar)
Solenoid valves:	proportional +24VDC / max.1A

2.3.2. ELECTRONIC COUNTER

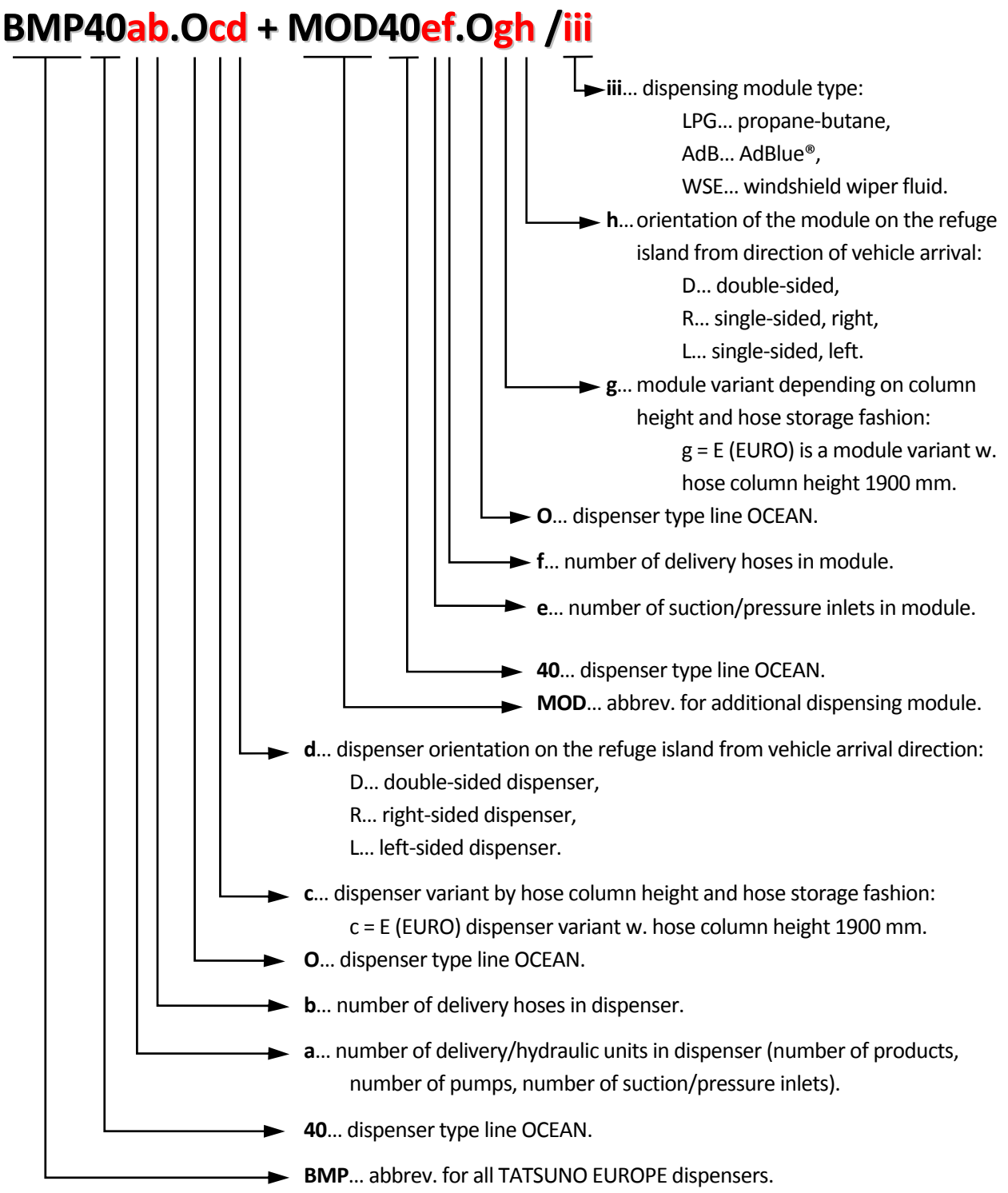
Power supply:	230 VAC; +10% -15%; 50 Hz ± 5 Hz	
Output:	max. 300 VA	
Displaying units (displays):	- volume	from 0.01 to 9999.99 L
	- amount	from 0.01 to 99999.9 CZK
	- unit price	from 0.01 to 99.99 CZK/L

2.3.3. AMBIENT CONDITIONS

Operating temperature:	from -20°C to +40°C for standard dispenser model
Medium temperature range: - PHM & LPG & WSE	from -20°C to +50°C
- AdBlue	from -10°C to +30°C
Mechanic environment class:	M1
Electromagnetic environment class:	E1
Relative humidity:	from 5% to 95%, non-condensing

2.4. DISPENSER MODEL IDENTIFICATION

The following section explains the marking (coding) system of the combined fuel dispensers OCEAN. The dispenser code comprises two codes – for the fuel dispenser and the additional dispensing module. The basic form of the commercial marking of the dispenser is:


BMP40ab.Ocd + MOD40ef.Ogh /iii
iii... dispensing module type:
LPG... propane-butane,
AdB... AdBlue®,
WSE... windshield wiper fluid.
h... orientation of the module on the refuge island from direction of vehicle arrival:
D... double-sided,
R... single-sided, right,
L... single-sided, left.
g... module variant depending on column height and hose storage fashion:
g = E (EURO) is a module variant w. hose column height 1900 mm.
O... dispenser type line OCEAN.
f... number of delivery hoses in module.
e... number of suction/pressure inlets in module.
40... dispenser type line OCEAN.
MOD... abbrev. for additional dispensing module.
d... dispenser orientation on the refuge island from vehicle arrival direction:
D... double-sided dispenser,
R... right-sided dispenser,
L... left-sided dispenser.
c... dispenser variant by hose column height and hose storage fashion:
c = E (EURO) dispenser variant w. hose column height 1900 mm.
O... dispenser type line OCEAN.
b... number of delivery hoses in dispenser.
a... number of delivery/hydraulic units in dispenser (number of products, number of pumps, number of suction/pressure inlets).
40... dispenser type line OCEAN.
BMP... abbrev. for all TATSUNO EUROPE dispensers.

2.4.1. ADDITIONAL ABBREVIATIONS IN DISPENSER MARKING

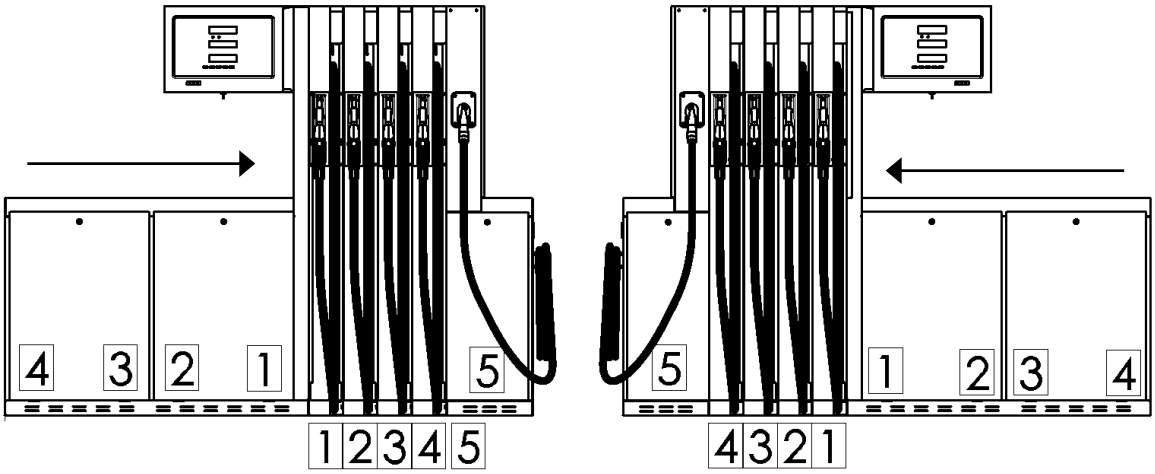
There may be additional abbreviations after the basic dispenser code:

Abbreviation	Description
/CUBE, /FIN, /WAVE	Dispenser with decorative elements
/S3	Dispenser in the pressure model without suction pumps
/VR, /VR2, /VR3, /VR4	Vapor recovery of one, two, three or four fuel products
/H, /H2, /H3, /H4	Higher performance of one, two, three or four diesel pumps 70 – 90 l/min
/UH, /UH2	High pumping performance of one or two diesel hoses 120 – 150 l/min
/MAS, /MAS2	The main dispenser (MASTER) has an outlet leading to one or two satellite dispensers (SLAVE)
/SAT	A satellite dispenser connected to the MASTER dispenser (without its own hydraulics)
/LON, /DART, /LOG	Data line with the interface IFSF-LON, DART or Logitron PUMALAN
/ER4, /TATPL, /ATCL	Data line with the interface Kienzle ER4, TATSUNO Party Line or Autotank ATCL
/TA2331	Outlet of pulses, nozzle and RELEASE signal to connect to Tankautomat TA2331
/ALX	Outlet of pulses and nozzle signal to connect to the terminal ALX (ALX-308)
-ZV1	Hose exit from the side of the dispenser / Position of the delivery nozzle on the side of the dispenser
-ZV2	Hose exit from the side of the dispenser / Position of the delivery nozzle on the front of the dispenser
-2C	Two simultaneous fuel deliveries from a single sided dispenser (two displays on the same side)
-4C	Four simultaneous fuel deliveries from a double sided dispenser (four displays on the dispenser)
-C1x	LED site number, 1 digit (0 to 9), x is a color (č-red, b-white, m-blue, ž-yellow, z-green)

Abbreviation	Description
-C2xx	LED site number, 2 digits (10 through 29), x is a color (č-red, b-white, m-blue, ž-yellow, z-green)

2.4.2. CONVENTIONAL MARKING OF THE DISPENSER PARTS

Fig. 1 shows the system of marking of the displays, dispenser nozzles, hoses, pumps, meters, and the system of ordering the products in an OCEAN EURO fuel dispenser. The additional LPG, AdBlue®, or WSE module is always positioned at the end of the dispenser as the last product and last delivery hose.



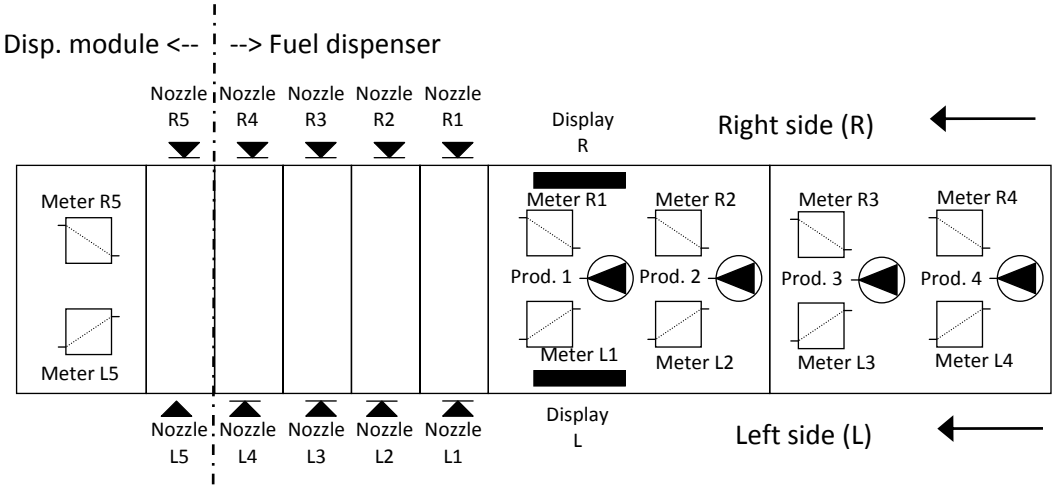


Fig. 1 – System of marking and order of products in combined OCEAN dispensers

2.5. STANDARD MODELS OF COMBINED OCEAN DISPENSERS

All models of fuel dispensers OCEAN are differentiated by the following properties:

a) method of pumping
- **suction**; dispensers are equipped with suction pumps
- **pressure** (REMOTE); dispensers do not include suction pumps, only filters – marking /S3

Note: Additional LPG, AdBlue® and WSE modules are in the pressure model, i.e. without pumps, as a standard.

b) number of dispensing points
1 to 4 independent dispensing points

Note: A dispensing point means the part of the dispensers where a customer can independently pump fuel. Depending on the type of the dispenser, every dispensing point is equipped with one to five dispensing hoses, where the customer may choose the desired type of fuel product, and at least one display. It is possible to dispense only one type of fuel product in one dispensing point at any given moment. The dispensers OCEAN are equipped with one or two dispensing points as a standard. On special request from the customer, it is possible to equip the dispensers with up to four dispensing points, i.e. 4 independent deliveries, 4 displays = 2 displays on each dispenser side. In case of two displays on each side of the combined dispenser, one display is dedicated to fuel delivery and the other for the additional module (LPG, AdBlue®, and WSE).

c) dispensers access
- **two-sided dispensers**; access to dispenser from two sides (TWO-SIDED)
- **one-sided dispensers**; access to dispenser from one side (ONE-SIDED)

d) number of fuel products
- depending on the type, a dispenser can dispense **one to four fuel products + one additional module product** (AdBlue® / LPG /WSE).

e) number of dispensing hoses
1 to 8 dispensing hoses for fuel + 1 to 2 dispensing hoses for additional module
- Every dispensing point of a dispenser is equipped with one to five dispensing hoses fitted with dispensing nozzles. A combined dispenser can have 1 to 10 dispensing hoses/nozzles.

f) pumping performance
- **dispensers with standard pumping performance** (40L/min)
- **dispensers with heightened pumping performance** (/H; 80L/min)
- **dispensers with high pumping performance** (/UH; 130-170L/min)

Note: Pumping performance means the maximum possible flow rate through the dispensing nozzle. It is given in liters per minute. OCEAN dispensers provide three basic pumping performances. The actual pumping performance, however, depends on the actual conditions at the fuel station – quality and lengths of suction piping, suction height etc. The maximum flow rate in additional modules depends on the module type, i.e. LPG Qmax= 50l/min; AdBlue® Qmax= 40l/min; WSE Qmax= 20l/min.

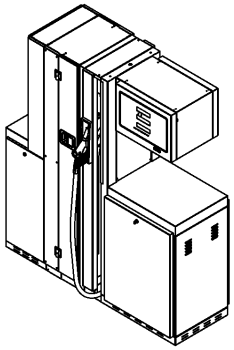
g) type of displays
- **dispensers with displays for public pumping** (amount/volume/price)
- **dispensers with displays for private pumping** (amount - only liter display)

Note: Depending on the displayed values, it is possible to divide all displays into liter displays and displays for public pumping. Liter displays contain only information about the pumped volume of fuel in centiliters and are used in dispensers specified for

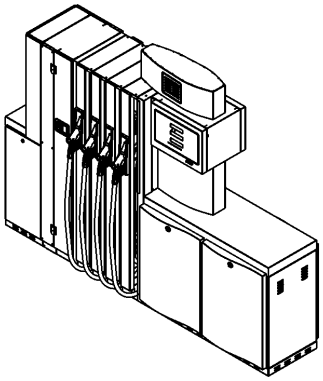
private dispensing (i.e. for business internal fuel stations). In addition to the volume information, displays for public pumping also contain the monetary amount in EUR and the unit price of the fuel product. Depending on the type of the displaying unit, it is possible to divide displays into standard LCD and proportional (graphic) LCD. Proportional displays can, unlike standard displays, also display text information for customers, for example advertisement texts, when pumping isn't taking place.

h) dispenser design
- **design model BASIC;** basic dispenser model design without decorative elements
- **design model WAVE**; dispenser with elements in the shape of a wave - marking /WAVE
- **design model CUBE**; dispenser with elements in the shape of a cube - marking /CUBE
- **design model FIN**; dispenser with elements in the shape of a sail/fin - marking /FIN

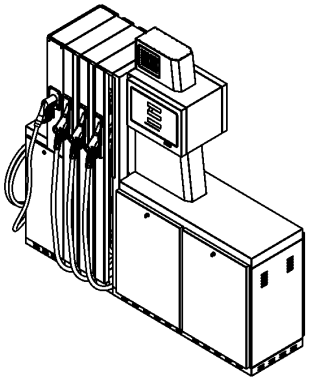
Examples of dispensers:



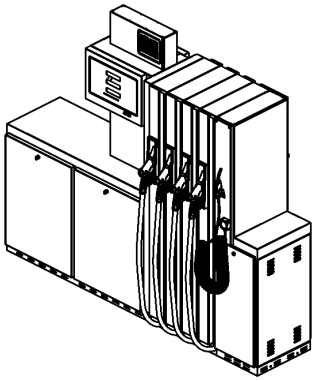
OCEAN BMP4012.OED/H + MOD4012.OED/AdB
(two-sided, single-product, two-hose dispenser OCEAN EURO with hose retractors, design model BASE, pumping performance 2 x 80 L/min with additional two-hose module for AdBlue® dispensing with pumping performance 2 x 40 L/min)



OCEAN BMP4044.OEL + MOD4011.OEL/AdB
(left-sided, four-product, four-hose dispenser OCEAN EURO with hose retractors, design model WAVE, pumping performance 4 x 40 L/min with additional single-hose module for AdBlue® dispensing with pumping performance 1 x 40 L/min)



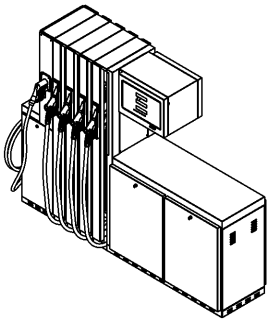
OCEAN BMP4036.OED + MOD4012.OED/LPG
(two-sided, three-product, six-hose dispenser OCEAN EURO with hose retractors, design model FIN, pumping performance 6 x 40 L/min with additional two-hose module for LPG dispensing with pumping performance 2 x 50 L/min)



OCEAN BMP4044.OER + MOD4011.OER/WSE
(right-sided, four-product, four-hose dispenser OCEAN EURO with hose retractors, design model CUBE, pumping performance 4 x 40 L/min with additional single-hose module for WSE dispensing with pumping performance 1 x 20 L/min)

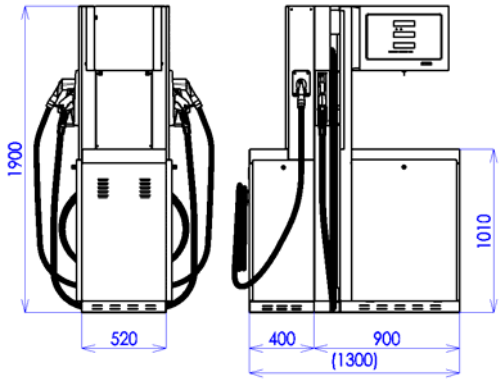
2.5.1. OCEAN EURO COMBINED DISPENSERS WITH LPG MODULE

The OCEAN EURO combined dispensers with LPG module (abbrev. OCEAN EURO COMBI LPG) comprise of the basic fuel dispenser OCEAN EURO and an additional LPG dispensing module. The combined dispensers are made in single-sided left (L), single-sided right (R) and double-sided (D) models with one to eight hoses for fuel dispensing with hose retractors and one or two free-hanging LPG dispensing hoses. The design for all dispensers can be chosen from BASE (basic), CUBE, WAVE, and FIN.
List of standard OCEAN EURO COMBI LPG models:

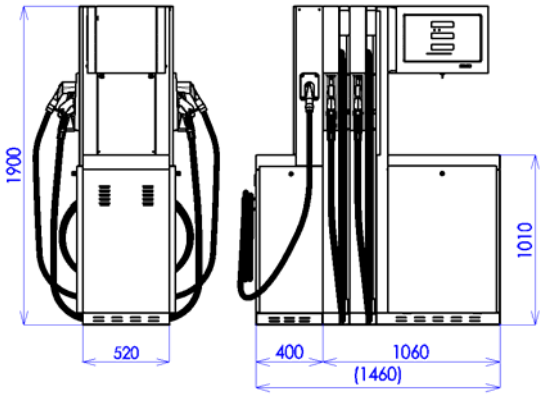


Fuel dispenser	+ LPG dispensing module	**Pumping method** *(S-suction, R-pressure/remote)*	**Access to dispenser** *(2-double sided, 1-single sided)*	**Total number of products** *(i.e. number of pumps or inlets)*	**Number of meters** *(i.e. number of measure systems)*	**Number of dispensing hoses** *(dispenser hoses + module hoses)*	**Number of main displays** *(i.e. number of simult. deliveries)*	**Standard dispenser performance** *[L/min]**	**Standard module performance** *[L/min]***
BMP4011.OEL(R)	**+ MOD4011.OEL(R)/LPG**	S	1	2	2	1+1	1	40	50
BMP4011.OEL(R)/S3	**+ MOD4011.OEL(R)/LPG**	R	1	2	2	1+1	1	40	50
BMP4011.OEL(R)-2C	**+ MOD4011.OEL(R)/LPG**	S	1	2	2	1+1	2	40	50
BMP4011.OEL(R)/S3-2C	**+ MOD4011.OEL(R)/LPG**	R	1	2	2	1+1	2	40	50
BMP4012.OED	**+ MOD4012.OED /LPG**	S	2	2	4	2+2	2	40	50
BMP4012.OED /S3	**+ MOD4012.OED /LPG**	R	2	2	4	2+2	2	40	50
BMP4012.OED -4C	**+ MOD4012.OED /LPG**	S	2	2	4	2+2	4	40	50
BMP4012.OED /S3 -4C	**+ MOD4012.OED /LPG**	R	2	2	4	2+2	4	40	50
BMP4022.OEL(R)	**+ MOD4011.OEL(R) /LPG**	S	1	3	3	1+1	1	40	50
BMP4022.OEL(R) /S3	**+ MOD4011.OEL(R) /LPG**	R	1	3	3	1+1	1	40	50
BMP4022.OEL(R) -2C	**+ MOD4011.OEL(R) /LPG**	S	1	3	3	2+1	2	40	50
BMP4022.OEL(R) /S3 -2C	**+ MOD4011.OEL(R) /LPG**	R	1	3	3	2+1	2	40	50
BMP4024.OED	**+ MOD4012.OED /LPG**	S	2	3	6	4+2	2	40	50
BMP4024.OED /S3	**+ MOD4012.OED /LPG**	R	2	3	6	4+2	2	40	50
BMP4024.OED -4C	**+ MOD4012.OED /LPG**	S	2	3	6	4+2	4	40	50
BMP4024.OED /S3 -4C	**+ MOD4012.OED /LPG**	R	2	3	6	4+2	4	40	50
BMP4033.OEL(R)	**+ MOD4011.OEL(R) /LPG**	S	1	4	4	3+1	1	40	50
BMP4033.OEL(R) /S3	**+ MOD4011.OEL(R) /LPG**	R	1	4	4	3+1	1	40	50
BMP4033.OEL(R) -2C	**+ MOD4011.OEL(R) /LPG**	S	1	4	4	3+1	2	40	50
BMP4033.OEL(R) /S3 -2C	**+ MOD4011.OEL(R) /LPG**	R	1	4	4	3+1	2	40	50
BMP4036.OED	**+ MOD4012.OED /LPG**	S	2	4	8	6+2	2	40	50
BMP4036.OED /S3	**+ MOD4012.OED /LPG**	R	2	4	8	6+2	2	40	50
BMP4036.OED -4C	**+ MOD4012.OED /LPG**	S	2	4	8	6+2	4	40	50
BMP4036.OED /S3 -4C	**+ MOD4012.OED /LPG**	R	2	4	8	6+2	4	40	50
BMP4044.OEL(R)	**+ MOD4011.OEL(R) /LPG**	S	1	5	5	4+1	1	40	50
BMP4044.OEL(R) /S3	**+ MOD4011.OEL(R) /LPG**	R	1	5	5	4+1	1	40	50
BMP4044.OEL(R) -2C	**+ MOD4011.OEL(R) /LPG**	S	1	5	5	4+1	2	40	50
BMP4044.OEL(R) /S3 -2C	**+ MOD4011.OEL(R) /LPG**	R	1	5	5	4+1	2	40	50
BMP4048.OED	**+ MOD4012.OED /LPG**	S	2	5	10	8+2	2	40	50
BMP4048.OED /S3	**+ MOD4012.OED /LPG**	R	2	5	10	8+2	2	40	50
BMP4048.OED -4C	**+ MOD4012.OED /LPG**	S	2	5	10	8+2	4	40	50
BMP4048.OED /S3 -4C	**+ MOD4012.OED /LPG**	R	2	5	10	8+2	4	40	50

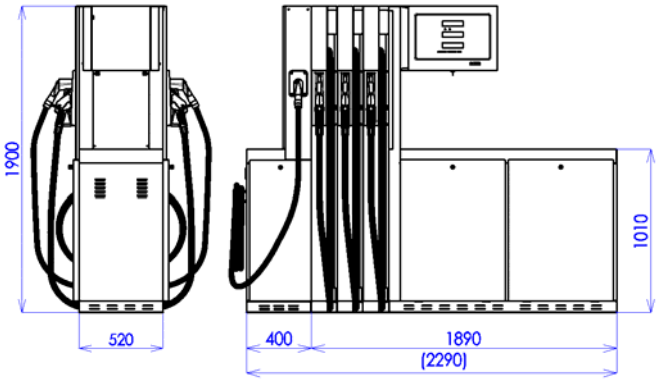
** The fuel dispenser can be made with other versions with heightened performance Q_{max}=80L/min. (/H), very high performance Q_{max}=130L/min. (/UH), see Chapter 2.4.*
*** The LPG module maximum performance is Q_{max}=50L/min.*



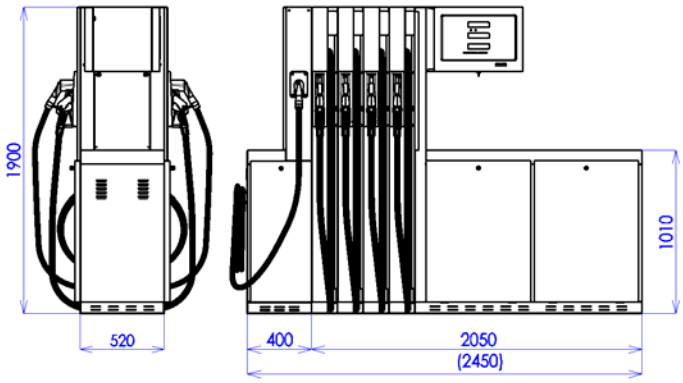
<---------- BMP4012.OED+MOD4012.OED/LPG <----------



<---------- BMP4024.OED+MOD4012.OED/LPG <----------

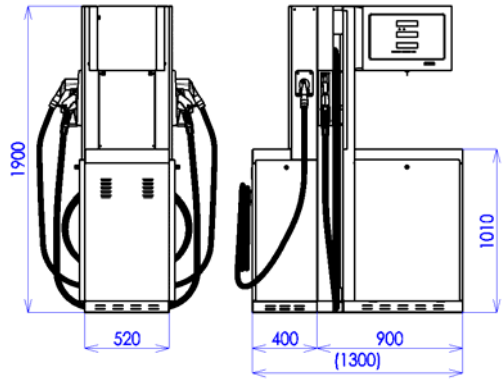


<---------- BMP4036.OED+MOD4012.OED/LPG <----------

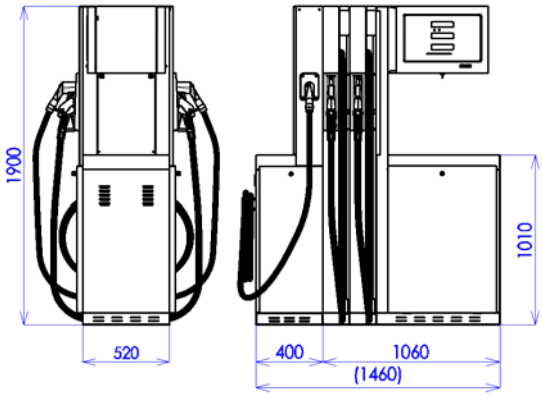


<---------- BMP4048.OED+MOD4012.OED/LPG <----------

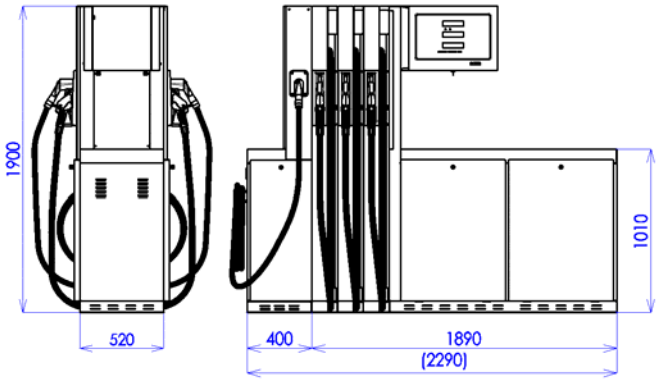
Figure 2 – Overview of standard OCEAN EURO COMBI LPG dispenser models in basic design without decorative elements with recommended vehicle arrival direction to dispenser (<----------)



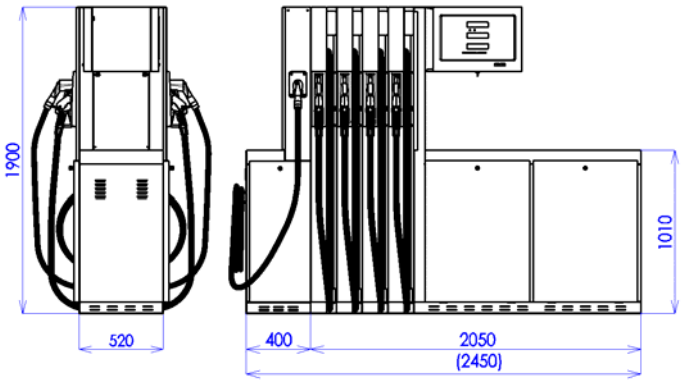
<---------- BMP4012.OED+MOD4012.OED/LPG <----------



<---------- BMP4024.OED+MOD4012.OED/LPG <----------

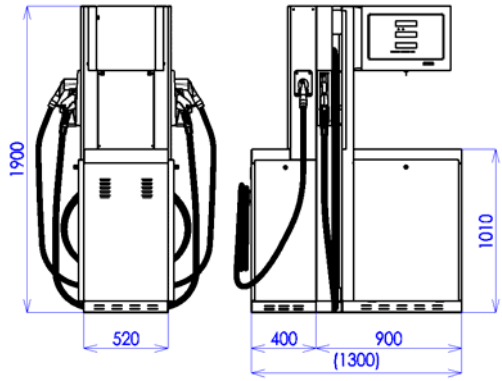


<---------- BMP4036.OED+MOD4012.OED/LPG <----------

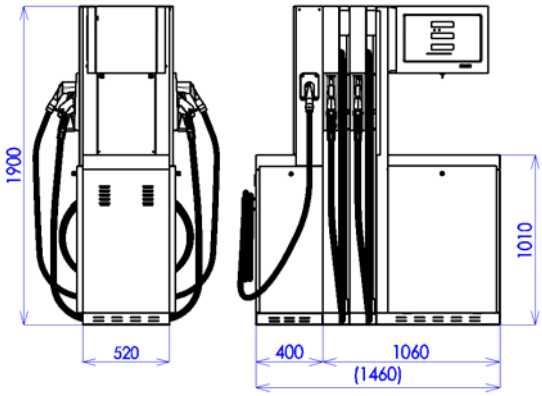


<---------- BMP4048.OED+MOD4012.OED/LPG <----------

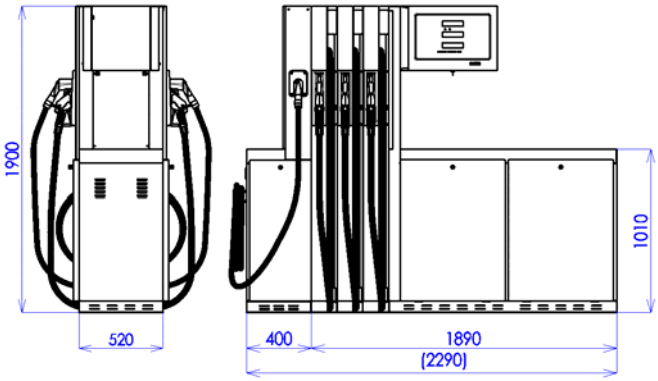
Figure 3 – Overview of standard OCEAN EURO COMBI LPG dispenser models in WAVE design with recommended vehicle arrival direction to dispenser (<----------)



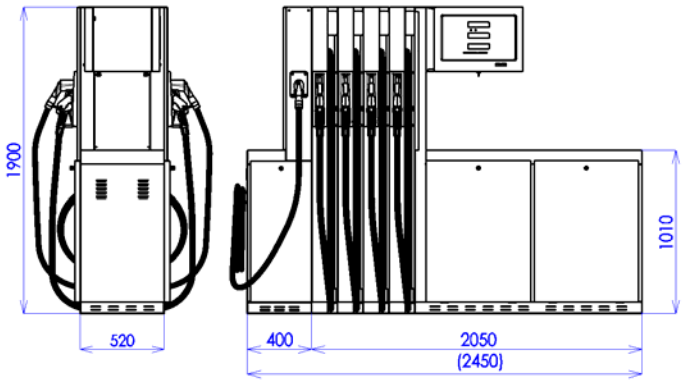
<---------- BMP4012.OED+MOD4012.OED/LPG <----------



<---------- BMP4024.OED+MOD4012.OED/LPG <----------

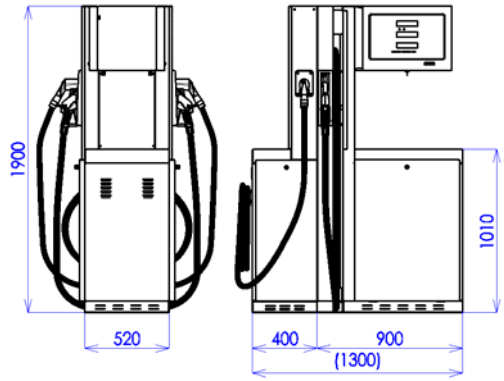


<---------- BMP4036.OED+MOD4012.OED/LPG <----------

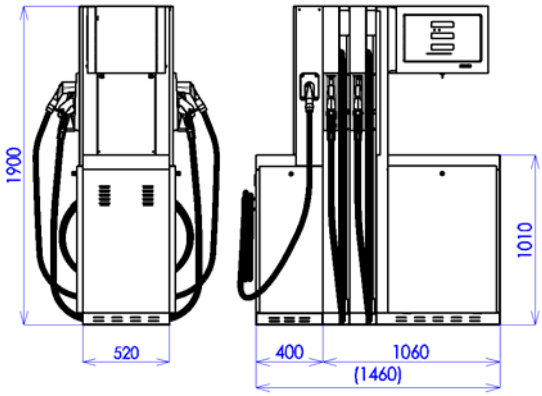


<---------- BMP4048.OED+MOD4012.OED/LPG <----------

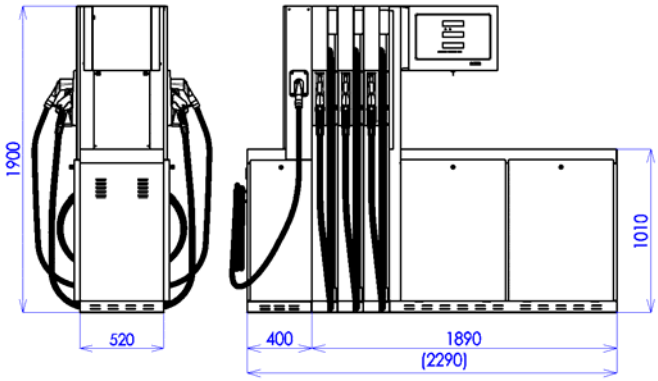
Figure 4 – Overview of standard OCEAN EURO COMBI LPG dispenser models in CUBE design with recommended vehicle arrival direction to dispenser (<----------)



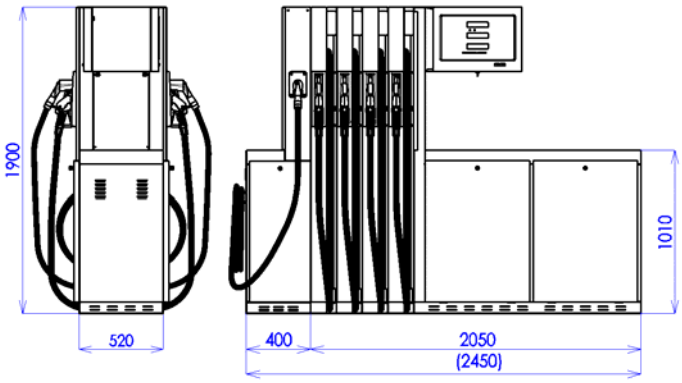
<---------- BMP4012.OED+MOD4012.OED/LPG <----------



<---------- BMP4024.OED+MOD4012.OED/LPG <----------



<---------- BMP4036.OED+MOD4012.OED/LPG <----------



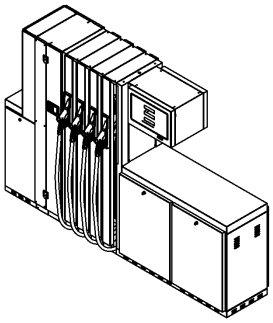
<---------- BMP4048.OED+MOD4012.OED/LPG <----------

Figure 5 - Overview of standard OCEAN EURO COMBI LPG dispenser models in FIN design with recommended vehicle arrival direction to dispenser (<----------)

2.5.2. OCEAN EURO COMBINED DISPENSERS WITH ADBLUE® MODULE

The OCEAN EURO combined dispensers with AdBlue® module (abbrev. OCEAN EURO COMBI ADB) comprise of the basic fuel dispenser OCEAN EURO and an additional AdBlue® dispensing module. The combined dispensers are made in single-sided left (L), single-sided right (R) and double-sided (D) models with one to eight hoses for fuel dispensing with hose retractors and one or two free-hanging AdBlue® dispensing hoses wound up in a heated additional module. The design for all dispensers can be chosen from BASE (basic), CUBE, WAVE, and FIN.

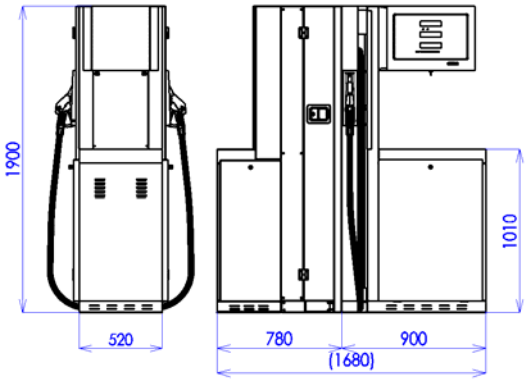
List of standard OCEAN EURO COMBI LPG models:



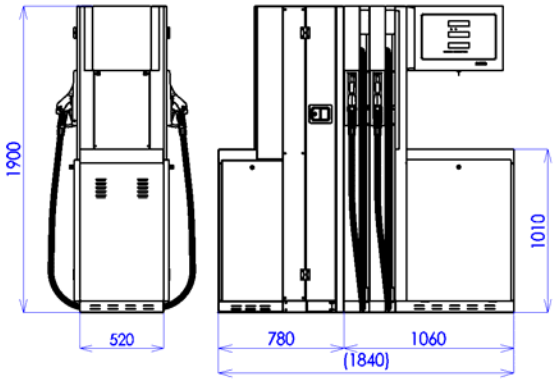
Fuel dispenser	+ LPG dispensing module	**Pumping method** *(S-suction, R-pressure/remote)*	**Access to dispenser** *(2-double sided, 1-single sided)*	**Total number of products** *(i.e. number of pumps or inlets)*	**Number of meters** *(i.e. number of measure systems)*	**Number of dispensing hoses** *(dispenser hoses + module hoses)*	**Number of main displays** *(i.e. number of simult. deliveries)*	**Standard dispenser performance** *[L/min]**	**Standard module performance** *[L/min]***
BMP4011.OEL(R)	**+ MOD4011.OEL(R)/AdB**	S	1	2	2	1+1	1	40	40
BMP4011.OEL(R)/S3	**+ MOD4011.OEL(R)/AdB**	R	1	2	2	1+1	1	40	40
BMP4011.OEL(R)-2C	**+ MOD4011.OEL(R)/AdB**	S	1	2	2	1+1	2	40	40
BMP4011.OEL(R)/S3-2C	**+ MOD4011.OEL(R)/AdB**	R	1	2	2	1+1	2	40	40
BMP4012.OED	**+ MOD4012.OED /AdB**	S	2	2	4	2+2	2	40	40
BMP4012.OED /S3	**+ MOD4012.OED /AdB**	R	2	2	4	2+2	2	40	40
BMP4012.OED -4C	**+ MOD4012.OED /AdB**	S	2	2	4	2+2	4	40	40
BMP4012.OED /S3 -4C	**+ MOD4012.OED /AdB**	R	2	2	4	2+2	4	40	40
BMP4022.OEL(R)	**+ MOD4011.OEL(R) /AdB**	S	1	3	3	1+1	1	40	40
BMP4022.OEL(R) /S3	**+ MOD4011.OEL(R) /AdB**	R	1	3	3	1+1	1	40	40
BMP4022.OEL(R) -2C	**+ MOD4011.OEL(R) /AdB**	S	1	3	3	2+1	2	40	40
BMP4022.OEL(R) /S3 -2C	**+ MOD4011.OEL(R) /AdB**	R	1	3	3	2+1	2	40	40
BMP4024.OED	**+ MOD4012.OED /AdB**	S	2	3	6	4+2	2	40	40
BMP4024.OED /S3	**+ MOD4012.OED /AdB**	R	2	3	6	4+2	2	40	40
BMP4024.OED -4C	**+ MOD4012.OED /AdB**	S	2	3	6	4+2	4	40	40
BMP4024.OED /S3 -4C	**+ MOD4012.OED /AdB**	R	2	3	6	4+2	4	40	40
BMP4033.OEL(R)	**+ MOD4011.OEL(R) /AdB**	S	1	4	4	3+1	1	40	40
BMP4033.OEL(R) /S3	**+ MOD4011.OEL(R) /AdB**	R	1	4	4	3+1	1	40	40
BMP4033.OEL(R) -2C	**+ MOD4011.OEL(R) /AdB**	S	1	4	4	3+1	2	40	40
BMP4033.OEL(R) /S3 -2C	**+ MOD4011.OEL(R) /AdB**	R	1	4	4	3+1	2	40	40
BMP4036.OED	**+ MOD4012.OED /AdB**	S	2	4	8	6+2	2	40	40
BMP4036.OED /S3	**+ MOD4012.OED /AdB**	R	2	4	8	6+2	2	40	40
BMP4036.OED -4C	**+ MOD4012.OED /AdB**	S	2	4	8	6+2	4	40	40
BMP4036.OED /S3 -4C	**+ MOD4012.OED /AdB**	R	2	4	8	6+2	4	40	40
BMP4044.OEL(R)	**+ MOD4011.OEL(R) /AdB**	S	1	5	5	4+1	1	40	40
BMP4044.OEL(R) /S3	**+ MOD4011.OEL(R) /AdB**	R	1	5	5	4+1	1	40	40
BMP4044.OEL(R) -2C	**+ MOD4011.OEL(R) /AdB**	S	1	5	5	4+1	2	40	40
BMP4044.OEL(R) /S3 -2C	**+ MOD4011.OEL(R) /AdB**	R	1	5	5	4+1	2	40	40
BMP4048.OED	**+ MOD4012.OED /AdB**	S	2	5	10	8+2	2	40	40
BMP4048.OED /S3	**+ MOD4012.OED /AdB**	R	2	5	10	8+2	2	40	40
BMP4048.OED -4C	**+ MOD4012.OED /AdB**	S	2	5	10	8+2	4	40	40
BMP4048.OED /S3 -4C	**+ MOD4012.OED /AdB**	R	2	5	10	8+2	4	40	40

** The fuel dispenser can be made with other versions with heightened performance Qmax=80L/min. (/H), very high performance Qmax=130L/min. (/UH), see Chapter 2.4.*

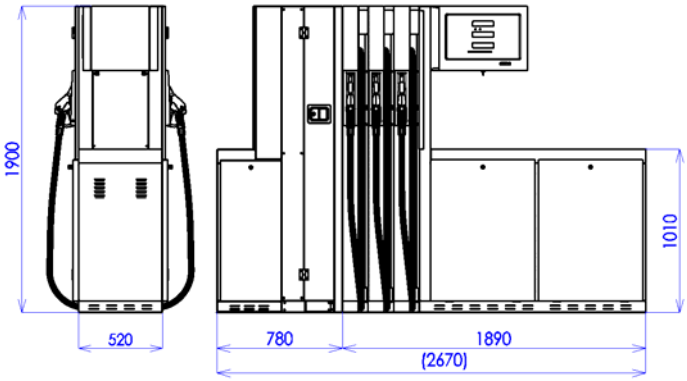
*** The AdBlue® module maximum performance is Qmax=40L/min.*



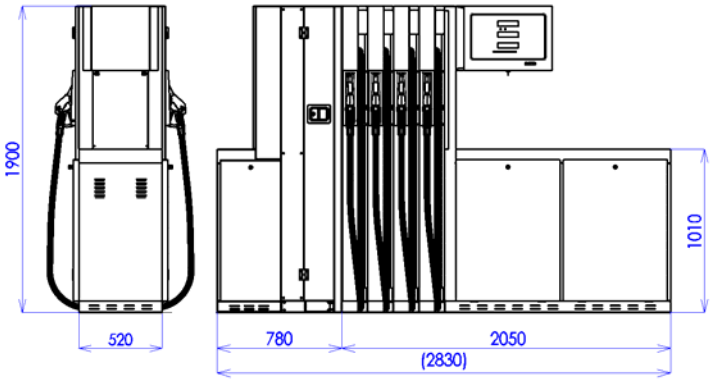
<---------- BMP4012.OED+MOD4012.OED/AdB <----------



<---------- BMP4024.OED+MOD4012.OED/AdB <----------

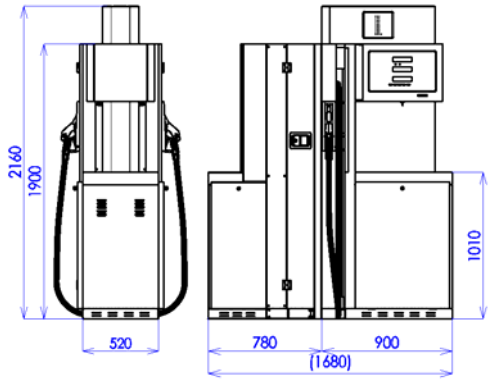


<---------- BMP4036.OED+MOD4012.OED/AdB <----------

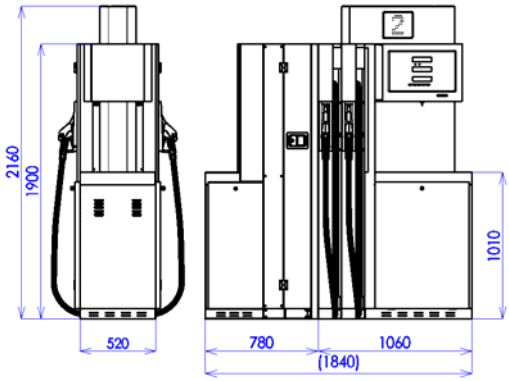


<---------- BMP4048.OED+MOD4012.OED/AdB <----------

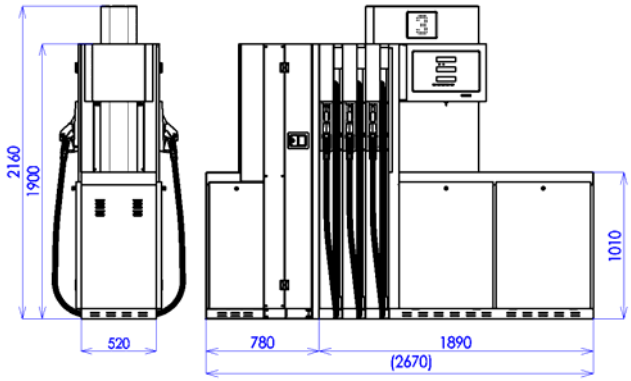
Figure 6 – Overview of standard OCEAN EURO COMBI ADB dispenser models in basic design without decorative elements with recommended vehicle arrival direction to dispenser (<----------)



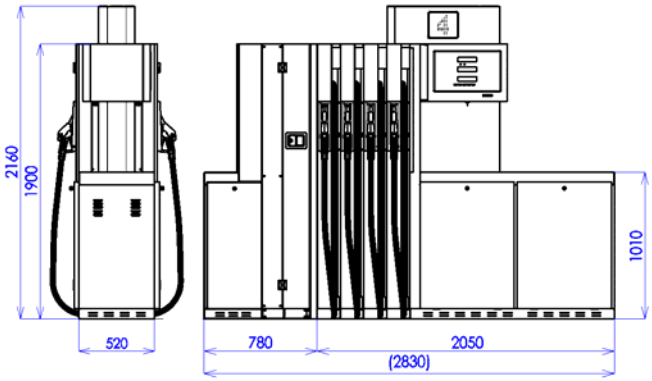
<---------- BMP4012.OED/WAVE + MOD4012.OED/AdB <----------



<---------- BMP4024.OED/WAVE + MOD4012.OED/AdB <----------

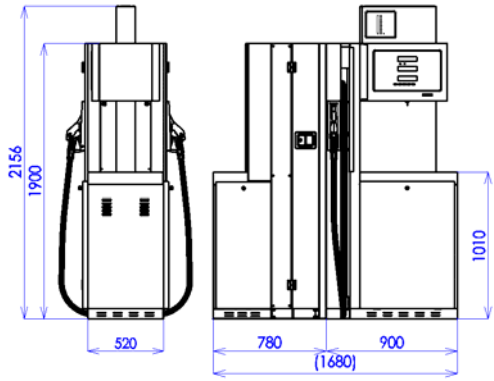


<---------- BMP4036.OED/WAVE + MOD4012.OED/AdB <----------

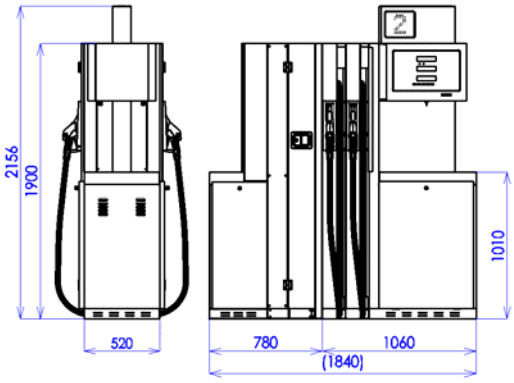


<---------- BMP4048.OED/WAVE + MOD4012.OED/AdB <----------

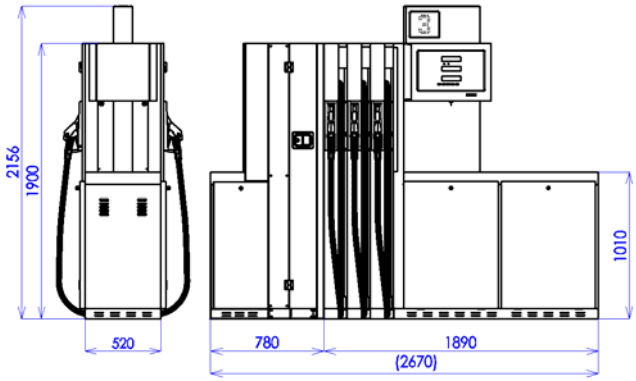
Figure 7 – Overview of standard OCEAN EURO COMBI ADB dispenser models in WAVE design with recommended vehicle arrival direction to dispenser (<----------)



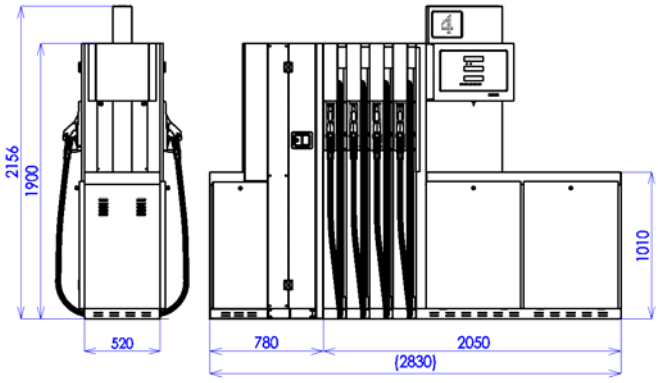
<---------- BMP4012.OED/CUBE + MOD4012.OED/AdB <----------



<---------- BMP4024.OED/CUBE + MOD4012.OED/AdB <----------

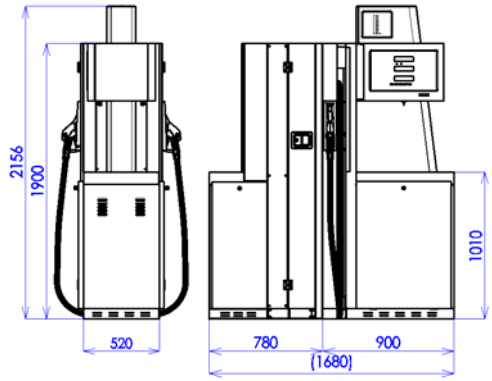


<---------- BMP4036.OED/CUBE + MOD4012.OED/AdB <----------

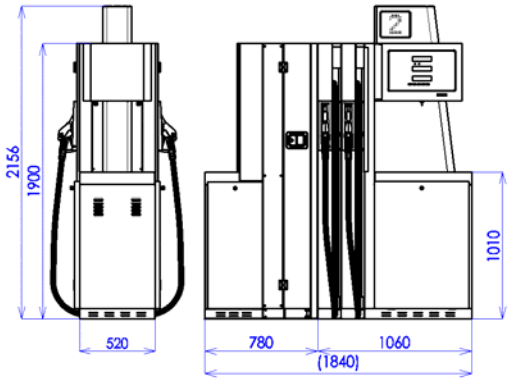


<---------- BMP4048.OED/CUBE + MOD4012.OED/AdB <----------

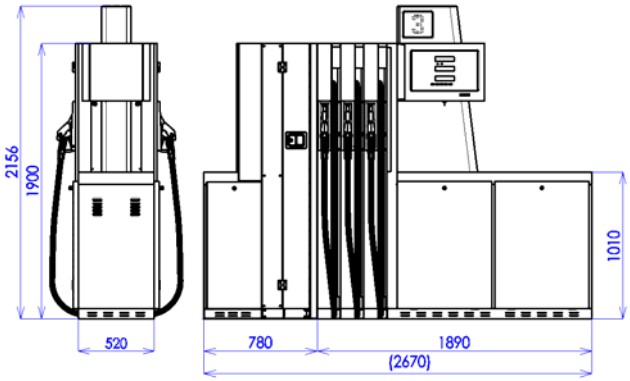
Figure 8 – Overview of standard OCEAN EURO COMBI ADB dispenser models in CUBE design with recommended vehicle arrival direction to dispenser (<----------)



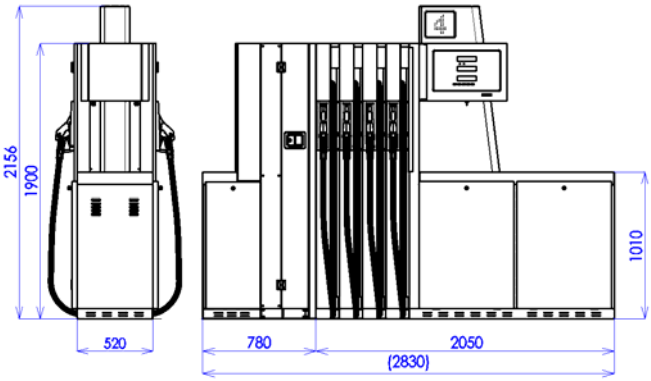
<---------- BMP4012.OED/FIN + MOD4012.OED/AdB <----------



<---------- BMP4024.OED/FIN + MOD4012.OED/AdB <----------



<---------- BMP4036.OED/FIN + MOD4012.OED/AdB <----------



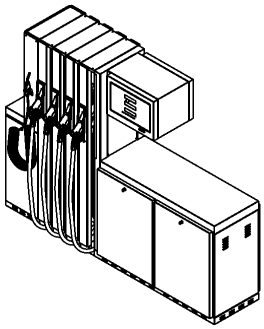
<---------- BMP4048.OED/FIN + MOD4012.OED/AdB <----------

Figure 9 – Overview of standard OCEAN EURO COMBI ADB dispenser models in FIN design with recommended vehicle arrival direction to dispenser (<----------)

2.5.3. OCEAN EURO COMBINED DISPENSERS WITH WSE MODULE

The OCEAN EURO combined dispensers with WSE module (abbrev. OCEAN EURO COMBI WSE) comprise of the basic fuel dispenser OCEAN EURO and an additional windshield wiper fluid (WSE) dispensing module. The combined dispensers are made in single-sided left (L), single-sided right (R) and double-sided (D) models with one to eight hoses for fuel dispensing with hose retractors and one or two free-hanging spiral-shaped WSE dispensing hoses. The design for all dispensers can be chosen from BASE (basic), CUBE, WAVE, and FIN.

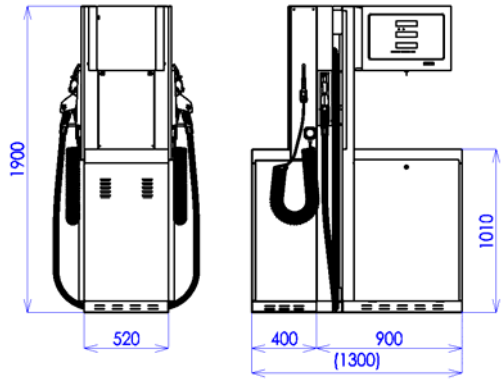
List of standard OCEAN EURO COMBI LPG models:



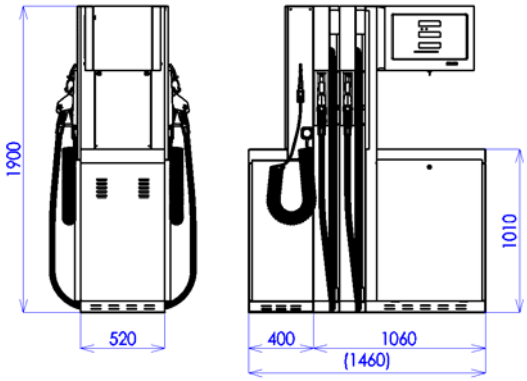
Fuel dispenser	+ LPG dispensing module	**Pumping method** *(S-suction, R-pressure/remote)*	**Access to dispenser** *(2-double sided, 1-single sided)*	**Total number of products** *(i.e. number of pumps or inlets)*	**Number of meters** *(i.e. number of measure systems)*	**Number of dispensing hoses** *(dispenser hoses + module hoses)*	**Number of main displays** *(i.e. number of simult. deliveries)*	**Standard dispenser performance** *[L/min]**	**Standard module performance** *[L/min]***
BMP4011.OEL(R)	**+ MOD4011.OEL(R)/WSE**	S	1	2	2	1+1	1	40	20
BMP4011.OEL(R)/S3	**+ MOD4011.OEL(R)/WSE**	R	1	2	2	1+1	1	40	20
BMP4011.OEL(R)-2C	**+ MOD4011.OEL(R)/WSE**	S	1	2	2	1+1	2	40	20
BMP4011.OEL(R)/S3-2C	**+ MOD4011.OEL(R)/WSE**	R	1	2	2	1+1	2	40	20
BMP4012.OED	**+ MOD4012.OED /WSE**	S	2	2	4	2+2	2	40	20
BMP4012.OED /S3	**+ MOD4012.OED /WSE**	R	2	2	4	2+2	2	40	20
BMP4012.OED -4C	**+ MOD4012.OED /WSE**	S	2	2	4	2+2	4	40	20
BMP4012.OED /S3 -4C	**+ MOD4012.OED /WSE**	R	2	2	4	2+2	4	40	20
BMP4022.OEL(R)	**+ MOD4011.OEL(R) /WSE**	S	1	3	3	1+1	1	40	20
BMP4022.OEL(R) /S3	**+ MOD4011.OEL(R) /WSE**	R	1	3	3	1+1	1	40	20
BMP4022.OEL(R) -2C	**+ MOD4011.OEL(R) /WSE**	S	1	3	3	2+1	2	40	20
BMP4022.OEL(R) /S3 -2C	**+ MOD4011.OEL(R) /WSE**	R	1	3	3	2+1	2	40	20
BMP4024.OED	**+ MOD4012.OED /WSE**	S	2	3	6	4+2	2	40	20
BMP4024.OED /S3	**+ MOD4012.OED /WSE**	R	2	3	6	4+2	2	40	20
BMP4024.OED -4C	**+ MOD4012.OED /WSE**	S	2	3	6	4+2	4	40	20
BMP4024.OED /S3 -4C	**+ MOD4012.OED /WSE**	R	2	3	6	4+2	4	40	20
BMP4033.OEL(R)	**+ MOD4011.OEL(R) /WSE**	S	1	4	4	3+1	1	40	20
BMP4033.OEL(R) /S3	**+ MOD4011.OEL(R) /WSE**	R	1	4	4	3+1	1	40	20
BMP4033.OEL(R) -2C	**+ MOD4011.OEL(R) /WSE**	S	1	4	4	3+1	2	40	20
BMP4033.OEL(R) /S3 -2C	**+ MOD4011.OEL(R) /WSE**	R	1	4	4	3+1	2	40	20
BMP4036.OED	**+ MOD4012.OED /WSE**	S	2	4	8	6+2	2	40	20
BMP4036.OED /S3	**+ MOD4012.OED /WSE**	R	2	4	8	6+2	2	40	20
BMP4036.OED -4C	**+ MOD4012.OED /WSE**	S	2	4	8	6+2	4	40	20
BMP4036.OED /S3 -4C	**+ MOD4012.OED /WSE**	R	2	4	8	6+2	4	40	20
BMP4044.OEL(R)	**+ MOD4011.OEL(R) /WSE**	S	1	5	5	4+1	1	40	20
BMP4044.OEL(R) /S3	**+ MOD4011.OEL(R) /WSE**	R	1	5	5	4+1	1	40	20
BMP4044.OEL(R) -2C	**+ MOD4011.OEL(R) /WSE**	S	1	5	5	4+1	2	40	20
BMP4044.OEL(R) /S3 -2C	**+ MOD4011.OEL(R) /WSE**	R	1	5	5	4+1	2	40	20
BMP4048.OED	**+ MOD4012.OED /WSE**	S	2	5	10	8+2	2	40	20
BMP4048.OED /S3	**+ MOD4012.OED /WSE**	R	2	5	10	8+2	2	40	20
BMP4048.OED -4C	**+ MOD4012.OED /WSE**	S	2	5	10	8+2	4	40	20
BMP4048.OED /S3 -4C	**+ MOD4012.OED /WSE**	R	2	5	10	8+2	4	40	20

** The fuel dispenser can be made with other versions with heightened performance Qmax=80L/min. (/H), very high performance Qmax=130L/min. (/UH), see Chapter 2.4.*

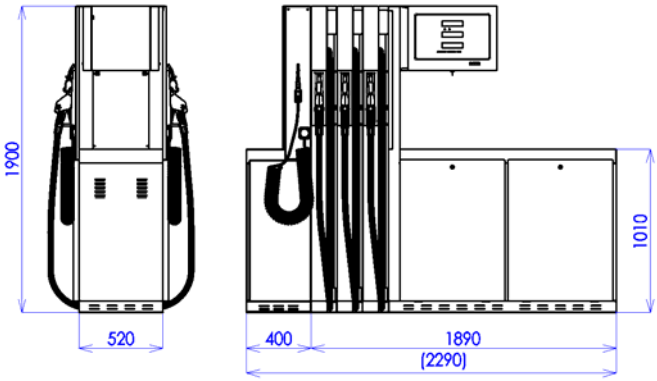
*** The WSE module maximum performance is Qmax=20L/min.*



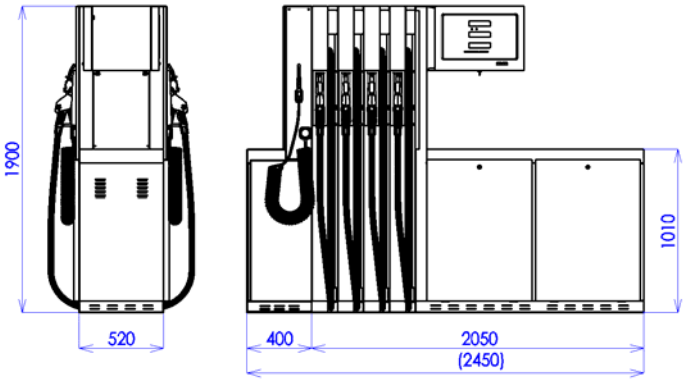
<---------- BMP4012.OED+MOD4012.OED/WSE <----------



<---------- BMP4024.OED+MOD4012.OED/WSE <----------

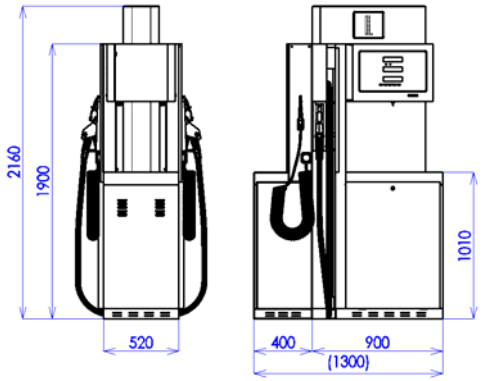


<---------- BMP4036.OED+MOD4012.OED/WSE <----------

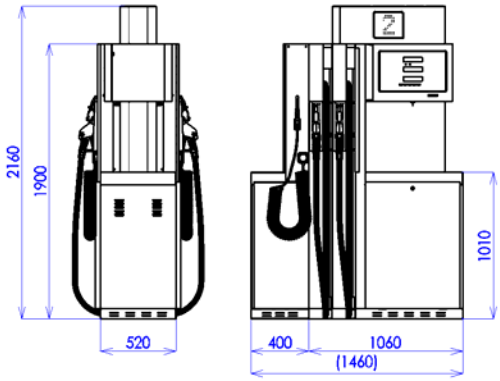


<---------- BMP4048.OED+MOD4012.OED/WSE <----------

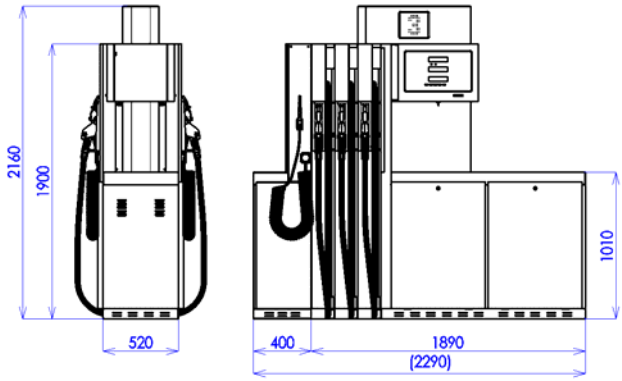
Figure 10 – Overview of standard OCEAN EURO COMBI WSE dispenser models in basic design without decorative elements with recommended vehicle arrival direction to dispenser (<----------)



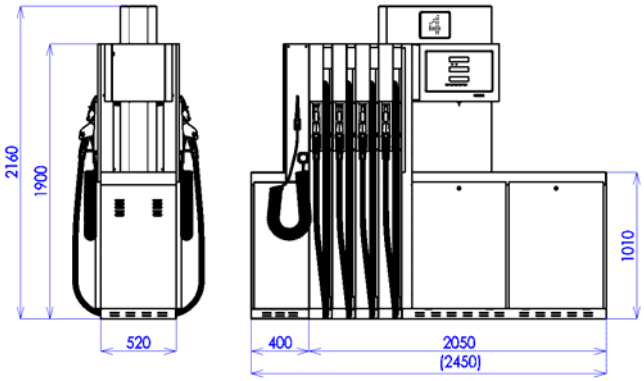
<---------- BMP4012.OED/WAVE + MOD4012.OED/WSE <----------



<---------- BMP4024.OED/WAVE + MOD4012.OED/WSE <----------

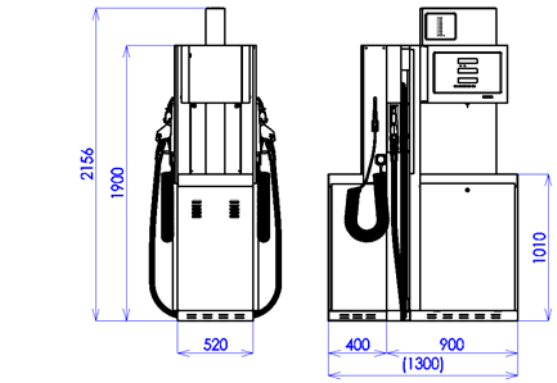


<---------- BMP4036.OED/WAVE + MOD4012.OED/WSE <----------

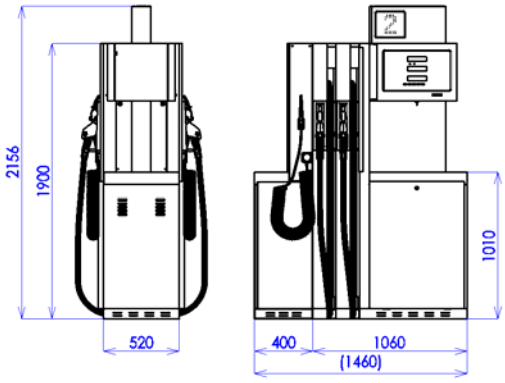


<---------- BMP4048.OED/WAVE + MOD4012.OED/WSE <----------

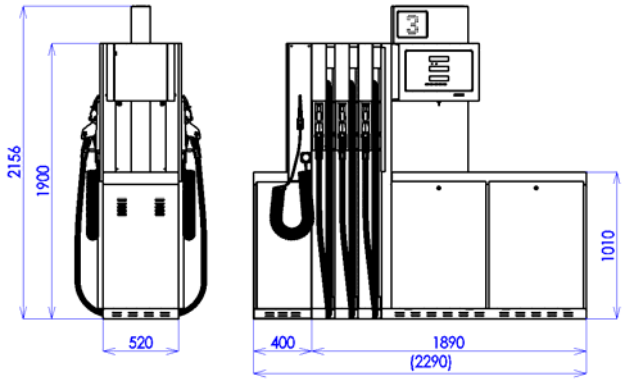
Figure 11 - Overview of standard OCEAN EURO COMBI WSE dispenser models in WAVE design with recommended vehicle arrival direction to dispenser (<----------)



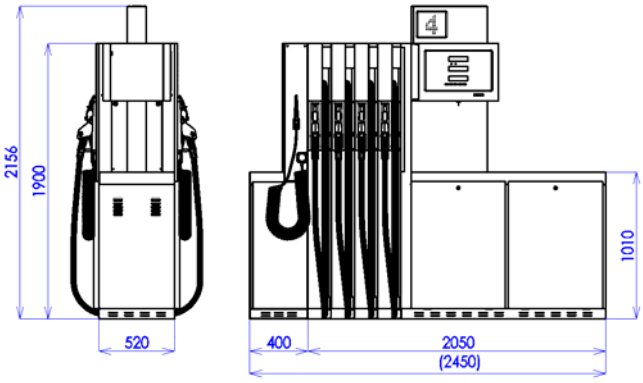
<---------- BMP4012.OED/CUBE + MOD4012.OED/WSE <----------



<---------- BMP4024.OED/CUBE + MOD4012.OED/WSE <----------

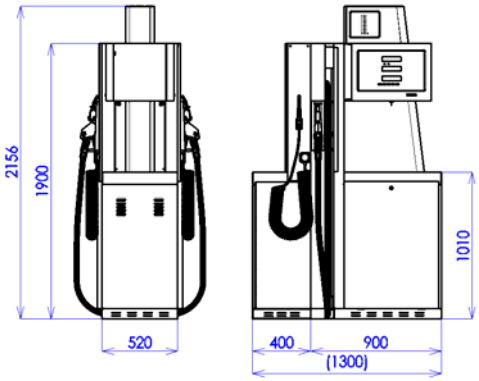


<---------- BMP4036.OED/CUBE + MOD4012.OED/WSE <----------

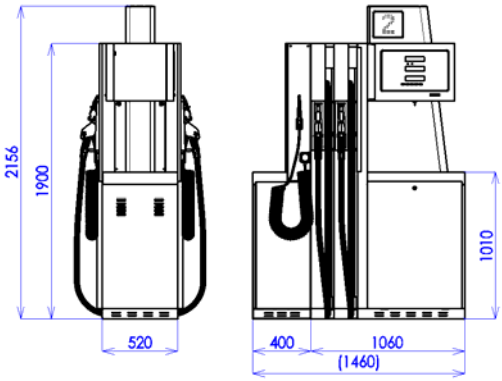


<---------- BMP4048.OED/CUBE + MOD4012.OED/WSE <----------

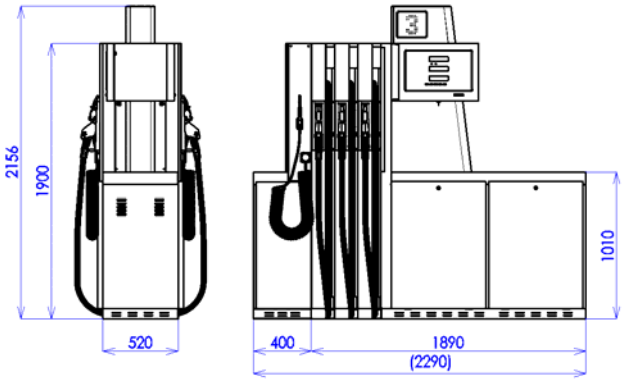
Figure 12 - Overview of standard OCEAN EURO COMBI WSE dispenser models in CUBE design with recommended vehicle arrival direction to dispenser (<----------)



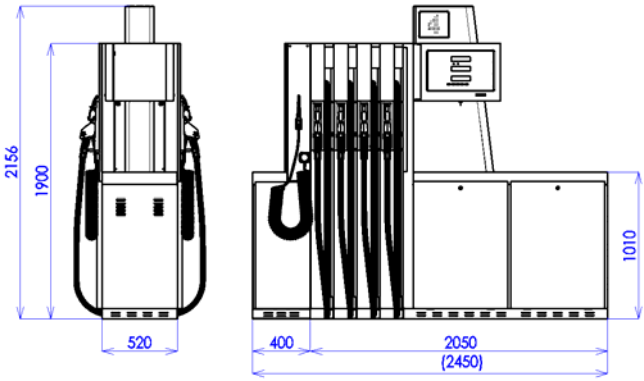
<---------- BMP4012.OED/FIN + MOD4012.OED/WSE <----------



<---------- BMP4024.OED/FIN + MOD4012.OED/WSE <----------



<---------- BMP4036.OED/FIN + MOD4012.OED/WSE <----------



<---------- BMP4048.OED/FIN + MOD4012.OED/WSE <----------

Figure 13 - Overview of standard OCEAN EURO COMBI WSE dispenser models in FIN design with recommended vehicle arrival direction to dispenser (<----------)

2.6. NAMING OF THE BASIC ELEMENTS OF DISPENSERS

2.6.1. FUEL DISPENSER PART

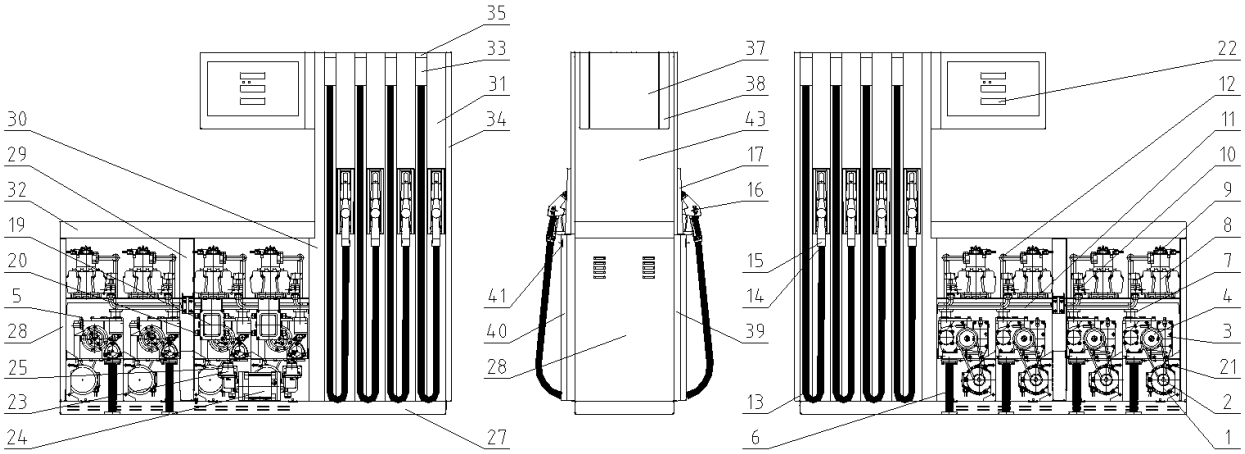


Figure 14 – Basic parts of an OCEAN dispenser

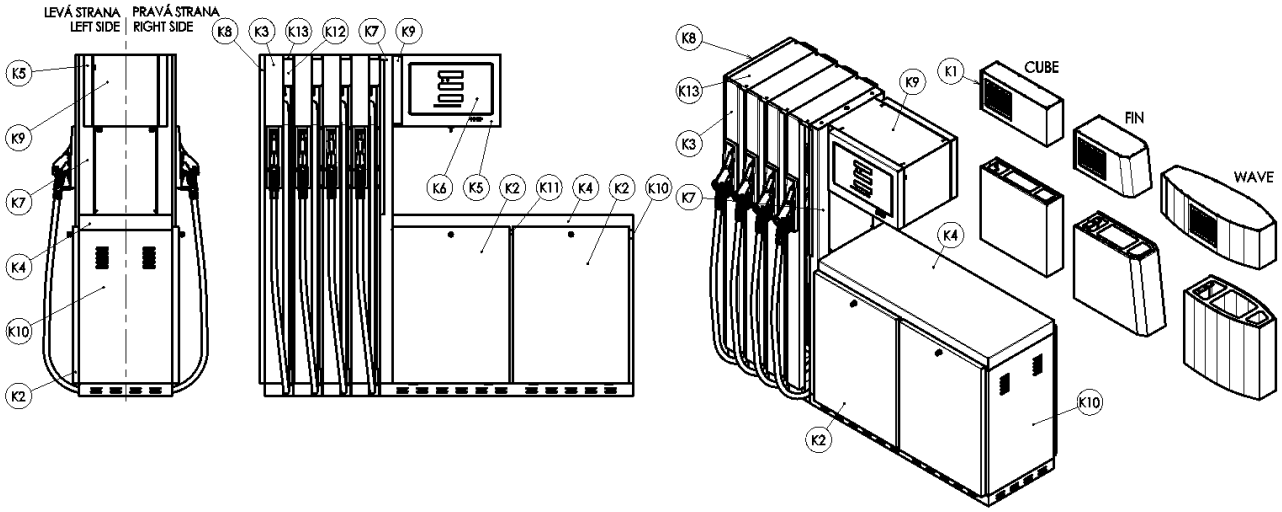


Figure 15 – Covers on OCEAN dispenser

Position	Device	Position	Device	Position	Device
1	Pump motor	**19**	Distribution box	**38**	Mask +display mask metal sheet
2	Motor pulley	**20**	Cable bushing - IP67	**39**	Right door
3	Pumping monoblock	**21**	V-belt (antistatic)	**40**	Left door
4	Pump pulley	**22**	Electronic counter	**41**	Latch lock
5	Air separator sensor	**23**	Vapor recovery pump	**-**	-
6	Connection element – flex. pipe	**24**	Vapor recovery motor	**K1**	Decorative elements
7	Output pipe	**25**	Vapor flow sensor	**K2**	Door
8	Meter	**27**	Dispenser foundation	**K3**	Hose retractor column
9	Pulser – impulse generator	**28**	Front column	**K4**	Hydraulics roof
10	Solenoid valve	**29**	Central column	**K5**	Display mask
11	Fuel pipe	**30**	Internal column	**K6**	Display mask metal sheet
12	Temperature sensor Pt100	**31**	Hose retractor column	**K7**	Internal column
13	Dispenser hose	**32**	Hydraulics roof	**K8**	Rear lid
14	Break-away Coupling	**33**	Roof of columns	**K9**	Counter head
15	Cylinder sight glass	**34**	Rear lid	**K10**	Front column
16	Dispenser nozzle	**35**	Roof lid	**K11**	Central column
17	Nozzle cover (“boot”)	**36**	Hose reel holder	**K12**	Roof of columns
(18)	Magn. sensor of nozzle position	**37**	Counter head	**K13**	Roof lid

2.6.2. LPG DISPENSING MODULE

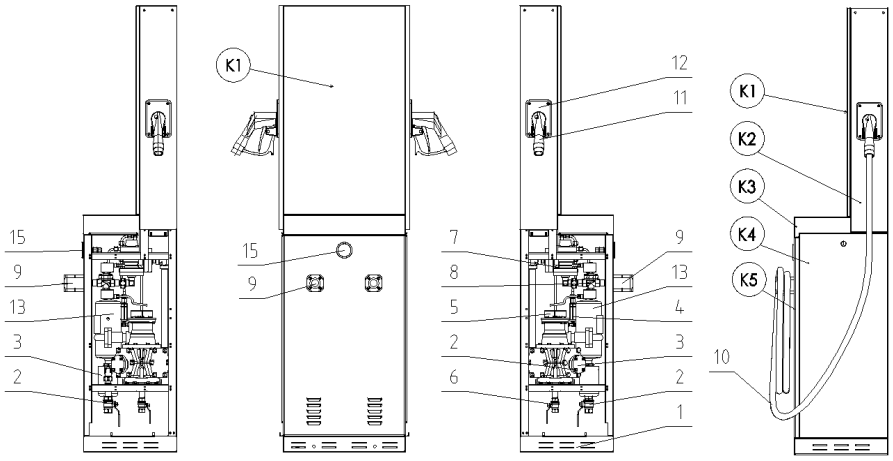


Figure 16 – Basic parts of LPG dispensing module and its covers

Position	Device	Position	Device	Position	Device
1	Module base frame	**8**	Solenoid valve	**15**	Manometer
2	Inlet ball valve (liquid)	**9**	Sight glass	**-**	-
3	LPG piston meter	**10**	Dispensing hose	**K1**	LPG rear column cover
4	Overpressure valve	**11**	Dispensing nozzle	**K2**	LPG column cover
5	Pulser – impulse generator	**12**	Nozzle cover (“boot”)	**K3**	LPG module roof
6	Outlet ball valve (gas)	**13**	Gas phase separator	**K4**	LPG module door
7	Differential valve	**14**	Filter	**K5**	LPG front column

2.6.3. ADBLUE® DISPENSING MODULE

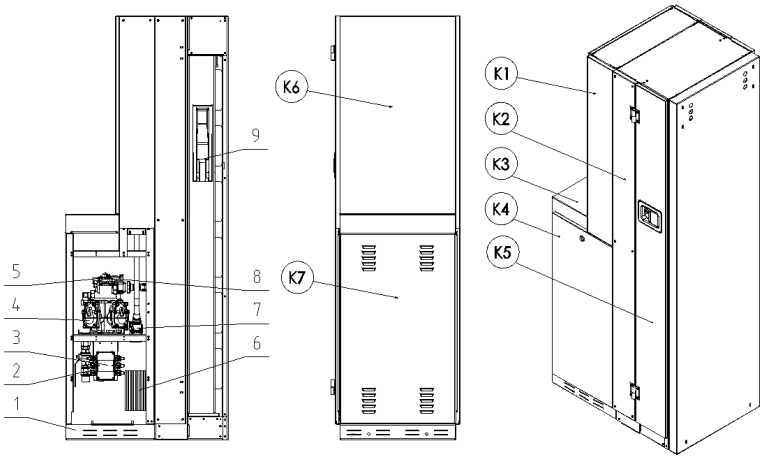


Figure 17 – Basic parts of AdBlue® dispensing module and its covers

Position	Device	Position	Device	Position	Device
1	Module base frame	**7**	Solenoid valve	**K3**	Hydraulics roof
2	Inlet ball valve	**8**	Filter	**K4**	Module hydraulics door
3	Heating distribution box	**9**	Nozzle cover (“boot”)	**K5**	AdBlue® hose door
4	AdBlue® piston meter	**-**	-	**K6**	Combi rear column cover
5	Pulser – impulse generator	**K1**	Column cover	**K7**	Combi front column
6	Heating body (ATEX)	**K2**	AdBlue® front cover	**-**	-

2.6.4. WSE DISPENSING MODULE

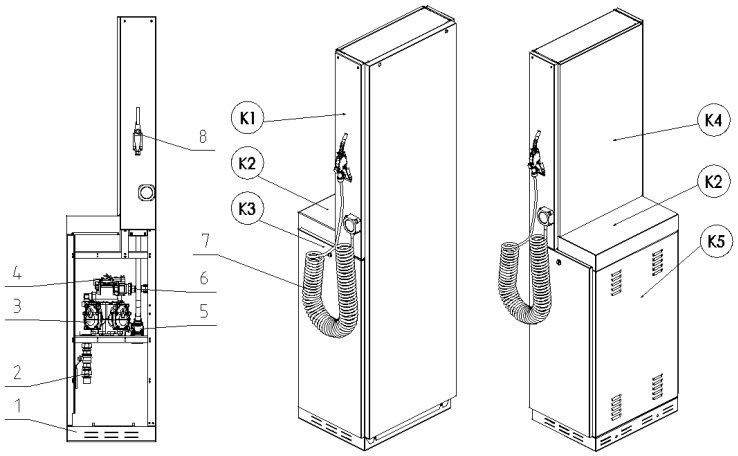


Figure 18 – Basic parts of WSE dispensing module and its covers

Position	Device	Position	Device	Position	Device
1	Module base frame	**6**	Filter	**K1**	Column roof
2	Inlet ball valve	**7**	Spiral-shaped disp. hose	**K2**	Hydraulics roof
3	AdBlue® piston meter	**8**	Dispensing nozzle	**K3**	Module hydraulics door
4	Pulser – impulse generator	**-**	-	**K4**	Combi rear column cover
5	Solenoid valve	**-**	-	**K5**	Combi front column

2.7. PRODUCTION LABELS

Each combined OCEAN dispenser is equipped with two type labels, one for the dispensing part and one for the module, and one orientation label for the dispenser. These labels are merged into one on single-product dispensers. The type label contains all data about the dispenser concerning its metrology and safety according to the WELMEC 10.5 standard and the EN 13617-1, article 7.4. norm. The orientation label serves metrology inspection for attachment of official metrology labels which affirm that the measurement system was reviewed.

2.7.1. FUEL DISPENSER LABELS

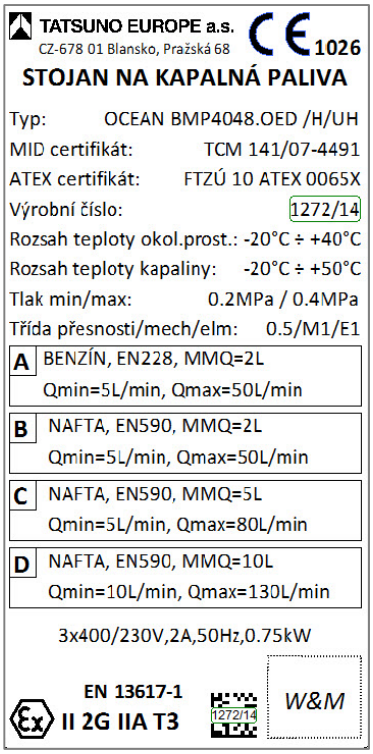


Figure 20 – Type label

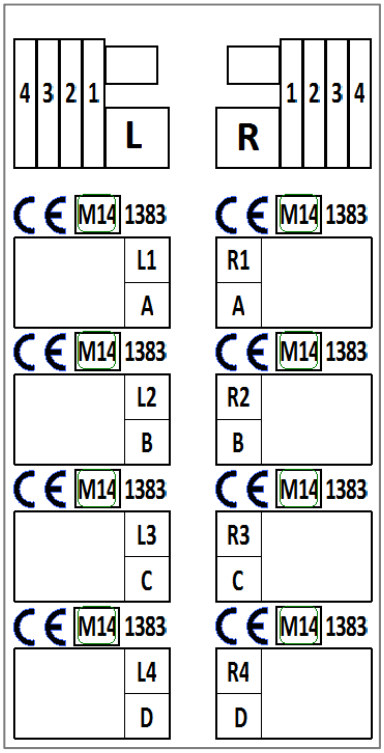


Figure 19 – Orientation label

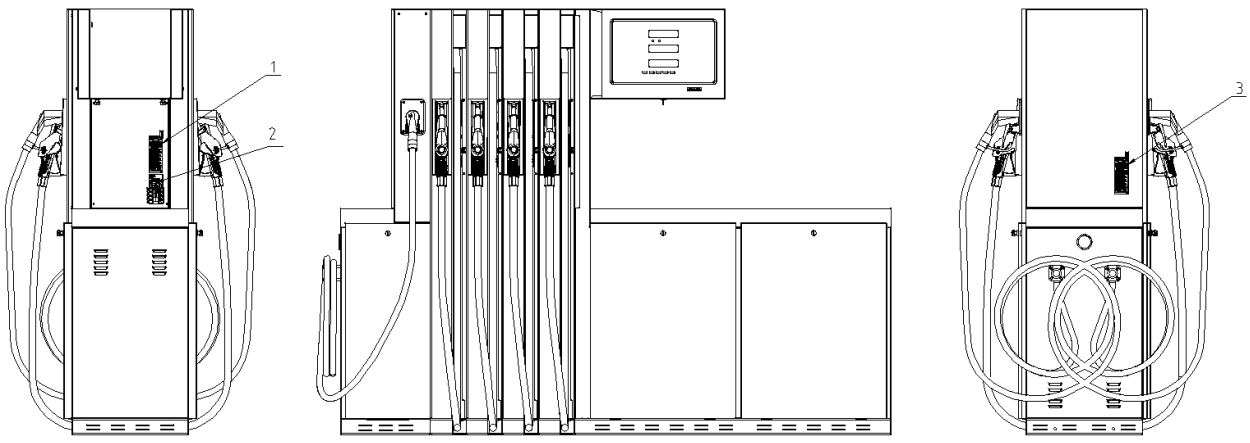


Figure 21 – Placement of the production labels on the dispenser (1 - type, dispenser; 2 - orientation, dispenser; 3 - type, module)

2.7.2. LABELS FOR ADBLUE® & LPG & WSE MODULES

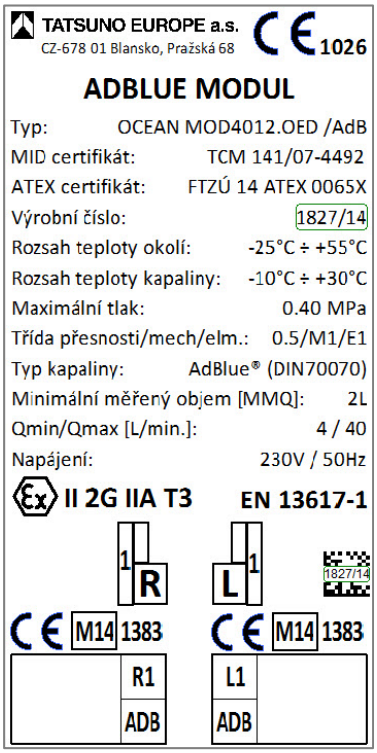


Figure 22 – Type label

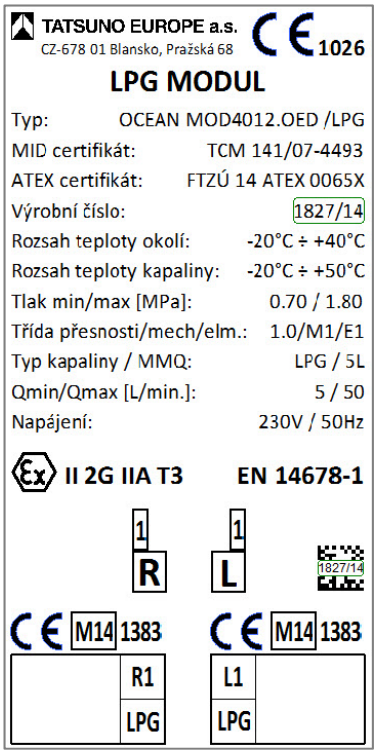


Figure 23 - Type label

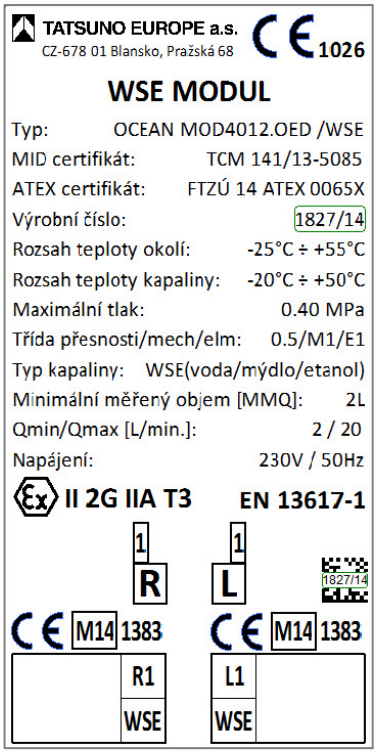


Figure 24 - Orientation label

Table 2 – Information on the dispenser and module labels

TATSUNO EUROPE a.s.	Name and address of the fuel dispenser producer
CE 1383	This dispenser marking means that it was designed, produced and marked in compliance with directives of the European Commission. The dispenser is subject to certification and type testing according to Directive 2004/22/ES – MID, performed by the notified body No. 1383 – ČMI Brno
CE 1026	This dispenser marking means that it was designed, produced and marked in compliance with directives of the European Commission. The dispenser is subject to certification and type testing according to Directive 1994/9/EC – ATEX, performed by the notified body No. 1026 – FTZÚ Ostrava Radvanice
STOJAN NA KAPALNÁ PALIVA	Type of device
Typ	Marking of the dispenser type (see chapter **Chyba! Nenalezen zdroj odkazů.**)
MID certifikát	No. of the metrological ES certificate of the measurement appliance type approval – ČMI
ATEX certifikát	No. of the ES certificate about type testing (ATEX certificate) – FTZÚ
Výrobní číslo	Production number of the dispenser (ordinal No. / year of production)
Rozsah teploty kapaliny	Temperature range of the pumped liquid for which the dispenser was designed and approved
Rozsah teploty okol. prost.	Temperature range of the environment for which the dispenser was designed and approved
Tlak min/max	Minimum and maximum operating pressure
Třída přesnosti/mech/elm	Accuracy class / Mechanical class / Electromagnetic class
NAFTA, BENZÍN, LPG, AdBLUE, WSE….	Types of measuring systems – metrology parameters: Measured liquid name + European norm; Q_{max} [L/min]… maximum performance; Q_{max} [L/min]… minimum flow rate; MMQ [L]…minimum delivery
Ex II 2G IIA T3	Marking of the non-explosive electric appliance protection method: **II 2** – equipment for areas with explosion hazards except underground mines, probability of explosive atmosphere formation – zone 1 **G** – explosive atmosphere formed by gases, vapors or fog **IIA** – group of gases – the least dangerous **T3** – max temperature of the electric appliance, which might cause ignition of the ambient atmosphere (200°C)
EN 13617-1; EN 14678-1	No. of the European norm, according to which the dispenser was approved
napájení motorů	Motor power supply: 3x400/230V; 2A; 50Hz; 0,75kW

3. INSTALLATION

3.1. INSTRUCTIONS FOR SAFE WORK

CAUTION

- *This appliance must be installed only by qualified authorized staff in compliance with relevant norms, directives and local limitations and according to this manual.*
- *In the immediate vicinity of the dispenser it is forbidden to smoke or use open fire.*
- *Always follow the procedures set for manipulation with petrol, diesel oil, LPG, AdBlue®, and WSE.*
- *Monitor any leakage in the dispenser. In case of fuel leakage resulting from insufficient tightness, disconnect the power supply and contact the service organization.*
- *Electric installation must be performed by qualified experts.*
- *Make sure that a properly working fire extinguisher is available.*
- *When manipulating with the equipment, use proper protection aids.*

3.2. RECEIPT, TRANSPORT, UNPACKING

The customer concludes a contract with the producer to organize the dispenser delivery. If the delivery is ensured by the company TATSUNO EUROPE a. s., the company will transport the product to the agreed location. The producer has sufficient experience with manipulation and transportation. If the delivery is ensured by the customer in another manner, the producer will ensure professional loading, but will not be responsible for the transport. In general, the dispenser must be transported properly packed and always fixed to the frame. In the transport vehicle the dispenser must be secured against damage (covers, paints), motion and tipping. Any manipulation and transport must be done in a vertical position; the dispenser must not be placed on its covers.

WARNING *During manipulation, only forklift vehicles may be used. If other manipulation methods are used, TATSUNO EUROPE a. s. does not provide warranty for any sustained damage!*

3.3. DISPENSER LOCATION

3.3.1. GENERALLY

The producer recommends placing the dispensers on the refuge islands of the fuel station in such a way that the direction of the vehicle arrival matches the arrows in Fig. 1, which also shows the numbering of products at the dispenser.

CAUTION->LPG ***To ensure safety of operation and safe function of the breakaway couplings in combined dispensers with the LPG dispensing module, it is necessary to install the dispenser with its LPG hose towards the fuel station exit!***

3.3.2. SINGLE-SIDED DISPENSER ORIENTATION

Single-sided dispensers are marked with the letter "L" and "R" ("L" – left, "R" – right) following the dispenser type designation (e.g. BMP4011.OE**L**+MOD4011.OE**L**/LPG is a left-, single-sided, single-product dispenser with a left-sided LPG dispensing module, and BMP4044.OE**R**+MOD4011.OE**R**/LPG is a right-, single-sided, single-product dispenser with a right-sided LPG dispensing module). The dispenser orientation is described from the point of view of the incoming vehicles – see Figure 25 and Figure 26.

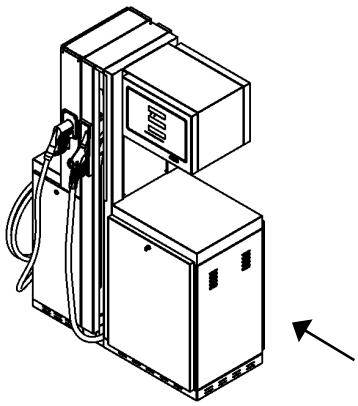


Figure 25 – Left-sided dispenser BMP4011.OEL+MOD4011.OEL/LPG (arrow indicates recomended direction of vehicle arrival)

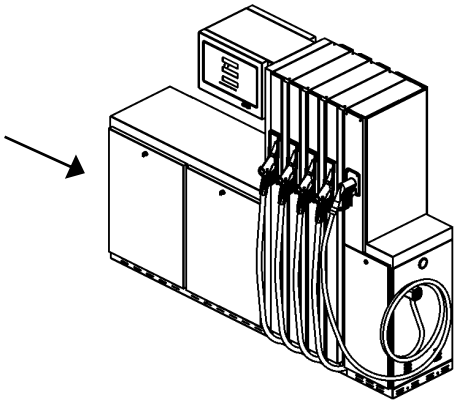


Figure 26 – Right-sided dispenser BMP4044.OER+MOD4011.OER/LPG (arrow indicates recomended direction of vehicle arrival)

CAUTION *OCEAN EURO combined dispensers with LPG module are as a standard equipped with a breakaway coupling, located between the dispensing hose and the dispenser, which breaks and interrupts the flow of LPG at both ends when affected by a force stronger than 200N and weaker than 500N.* ***For correct function of the breakaway coupling, it is nevertheless necessary to adhere to the recommended direction of vehicle arrival to the dispenser!***

3.3.3. DISTANCE OF THE DISPENSER FROM THE TANK

The producer recommends that the maximum distance of the dispensers from the LPG, WSE or AdBlue® tank should be **50 meters** and the maximum suction height **5.5 meters**. Otherwise, suction performance of the dispenser may be hindered, which leads to lowering of the fuel suction pump performance (nominal flow rate) and/or increased noise levels. All technical requirements for the fuel station must be governed by a professionally prepared and duly approved fuel station project consulted with the dispenser producer.

The manufacturer recommends that the minimum distance of a single-sided dispenser from the kiosk wall should be **1 m**.

3.3.4. STATION FUEL TANK TYPE

Combined dispensers OCEAN EURO can be connected to underground fuel tanks or aboveground fuel tanks.

A steel base frame is installed horizontally and cemented to the shaft that connects to the suction piping of the storage (underground) tank. This base frame is not part of the dispenser supply. The dispenser is attached to this frame. The following supply cables must lead to the shaft under the dispenser in addition to the grounding conduits:

- **4-wire cable for powering the three-phase electromotors of fuel and vacuum pumps**
  - a harmonized cable of type H05VV5-F 4x1,5 is recommended
- **3- or 5-wire cable powering the electronic counter, switching circuits and AdBlue® module heating**
  - a harmonized cable of type H05VV5-F 3x1,5 for dispensers with LPG or WSE modules, or a harmonized cable of type H05VV5-F 5x1,5 for dispensers with AdBlue® modules, is recommended
- **3-wire cable for switching the pumps of the LPG, WSE or AdBlue® modules**
  - a harmonized cable of type H05VV5-F 3x1,5 is recommended
- **4-wire shielded cable for data line**
  - a harmonized shielded cable of type H05VVC4V5-K 5x0,5
- **3-wire cable for STOP button safety circuit**
  - A harmonized cable of type H05VV5-F 3x1,5 is recommended. This cable is only required in dispensers with an LPG module operating in the standalone mode.

CAUTION ***As a supply cable, only a cable that complies with the requirements of the European standard EN 13617-1:2012 may be used. Among the basic attributes of these cables is their resistance to oil, gasoline and gasoline vapors (according to HD21 13S1).***

CAUTION ***Due to safety and environmental protection it is necessary to install a leakage tray to catch any leakage of fuel.***

Next, the dispenser is connected to the suction pipe via a flexible pipe.

The dispenser foundation plans are in Appendix 1.1.

NOTICE ***The connections to the dispenser must be sealed in such a way that no flammable liquids or their vapors can get inside. In the shafts under the dispenser, only cable connectors resistant to flammable liquids may be used.*** *Cable glands may only be used for one cable, unless they are glands designed for more cables.*

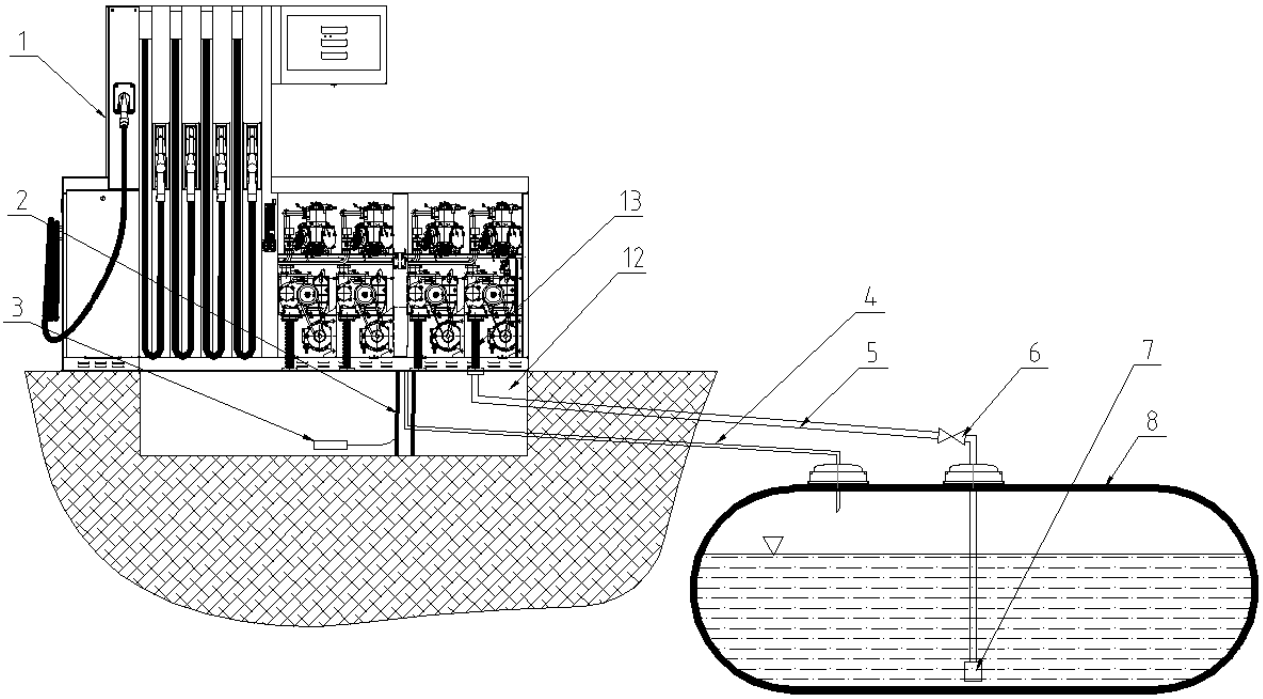


Figure 27 – Example of connection between the fuel dispensing part and the underground tank

Legend: 1 – combined dispenser, 2 – electric supply cables and data line, 3 – sensor of liquids located on the bottom of the leakage tray, 4 – piping for vapor recovery (recuperation), 5 – suction fuel piping, 6 – check valve, 7 – suction basket (without check valve), 8 – underground fuel tank, 12 – leakage ECO tray with dispenser base frame, 13 – connection element (flexible pipe) with flange.

CAUTION *If the dispenser is connected to an **underground tank**, it is necessary to insert a **check valve** into the suction piping, to secure that when the dispenser is idle, the fuel column is not broken, because this would lead to the suction of air after commencing the next fuel delivery. **An independent check valve may not be installed if the suction basket is already equipped with a check valve (see Figure 27).***

CAUTION

*If the dispenser is connected to a surface tank, due to safety reasons the suction piping must involve an **overpressure (check) valve** to prevent product leakage from the tank caused by gravity. The valve simultaneously serves to free the overpressure in the suction piping back into the tank. We recommend the **OPW 199ASV (Anti-Siphon Valve)**. The valve type needs to be chosen depending on the difference between the maximum height of the fuel in the tank and the minimum point of the fuel piping - see Figure 28, height A.*

*At the lowest point of the piping, a **stop and bleed valve** should be installed, which should be closed by the operator whenever the dispenser is idle. If there aren't such valves, any leakage in the fuel system may cause **uncontrolled fuel leakage (see Figure 28)**.*

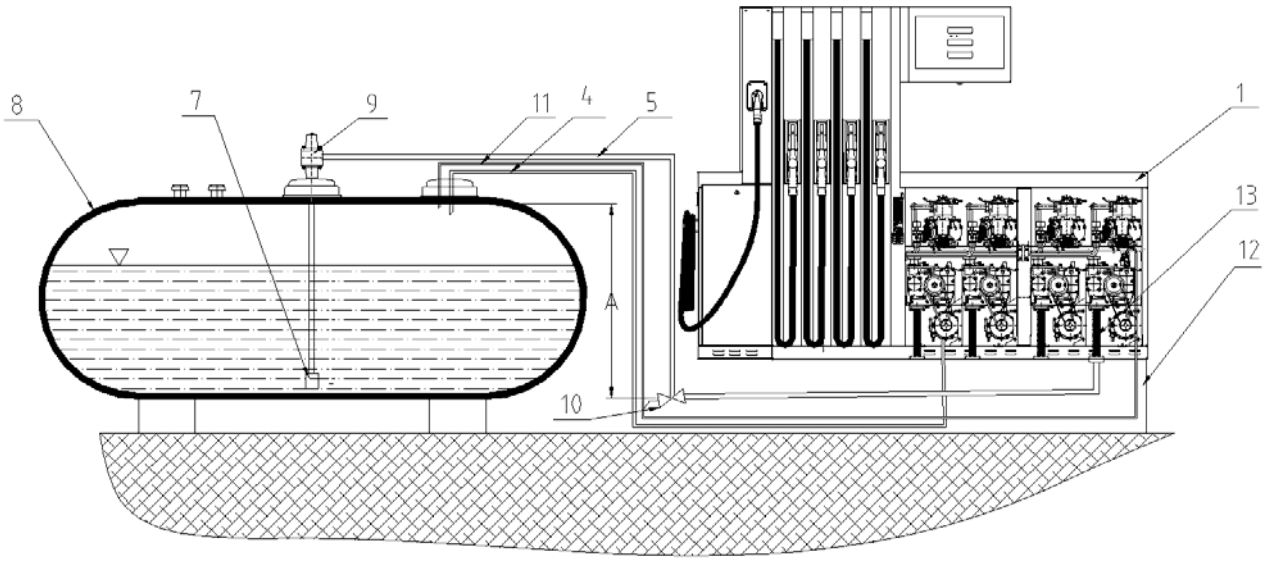


Figure 28 – Example of suction piping connecting the fuel dispensing part and a surface tank

Legend: 1 – dispenser, 4 – piping for vapor recovery (recuperation), 5 – suction fuel piping, 7 – strainer (without check valve), 8 – surface fuel tank, 9 – overpressure check valve (OPW 199ASW), 10 – stop and bleed valve, 11 – return piping from the dispenser separator, 12 – ECO leakage container with dispenser base frame, 13 – connecting flexible pipe with flange

NOTICE ***Surface tanks****. The pumping monoblock of fuel dispensers is structurally designed with a permanently open air separator into the venting chamber created by the space in the monoblock body and the space of the monoblock lid. In the top wall of the lid, there is an opening containing a connector DN6 for connecting air venting pipes. To prevent overpressure of the venting chamber of the monoblock in the dispenser's idle stage in case of insufficient air-tightness or blocking of the check valve, and to prevent the ensuing leakage of the medium into the inner space of the dispenser and subsequently into its surroundings,* ***it is necessary to interconnect the output of the pumping monoblock and the storage tank****. The connection can be made using a pipe Ø 10 x 1 (DN8) connected to the pipe connector DN8. The pipe connector is screwed over a seal in the opening M12x1,5 in the top wall of the monoblock lid. The outlet of the pipe must be led into the lid of the storage tank using a pipe corner connector DN8S.*

3.3.5. DISTRIBUTION PIPES

The dispenser manufacturer recommends installing distribution pipes in the standard manner, with each dispenser pump having a separate pipe to the respective fuel tank.

NOTE *There is also the option of a "backbone" fuel distribution system, where several dispensers (pumps) are connected to a single supply pipe from the tank. The dispenser manufacturer* ***does not recommend*** *this backbone distribution type due to the risk of instability in the fuel suction from the tanks. If the designer should decide to use the backbone distribution type anyway, the dispenser producer requires inserting* ***disc valves*** *in the suction piping, to functionally isolate individual dispensers. Disc valves such as C09 DN32 are produced by the company Armatury Group a.s., Kravaře.*

3.3.6. DISPENSER LOCATION IN RELATION TO EXTERNAL INFLUENCES

CAUTION *Hazardous areas are defined according to ČSN EN 60079-10-1:2009 in the surroundings of the fuel dispenser.* ***Fuel dispenser of the OCEAN EURO series must not be located in explosion hazard areas****, i.e. in hazardous areas defined by the norm ČSN EN 60079-10-1:2009. Electronic counters used in these dispensers do not have any cover, are located in areas with no risk of explosion and are separated from other areas with a partition of type 1 according to ČSN EN 13617-1.*

3.3.7. PRESSURE SYSTEM

OCEAN EURO combined dispensers can be connected not only to a classical suction system, where the fuel is sucked out of the fuel tank via the pumps located in the dispensers, but it can also be connected to a **pressure system**, where the fuel is "pushed" in the dispensers directly out of the tanks, which have central submersible pumps (such as the RED JACKET system). The advantage of the pressure system is very low noise operation of the dispensers, but the disadvantage is high demand for the quality and sealing of the fuel piping. In the pressure system the dispenser has no pumping monoblock. The fuel piping is connected via an emergency breakaway valve, which is under the fuel dispenser and is firmly attached to its base frame. From there the fuel goes to the filter and is distributed via meters and control valves to the dispensing hoses and nozzles.

CAUTION ***According to the European norm EN 13617-1:2012, OCEAN EURO dispensers connected to a pressure system must have an emergency breakaway valve, which will shut off the pressure intake in case the dispenser is broken off!*** *The emergency shut off valve is not part of the standard delivery of fuel dispensers. The dispenser producer recommends using the valve OPW 10BF. The fuel intake to the dispensers is through a pipe with a cap nut with an internal thread G1". The position of the intake piping is shown in Appendix 1, where you also can see the recommended connection to the pressure piping.*

CAUTION ***It is necessary to ensure that the maximum pressure at the fuel intake to the dispenser does not exceed 0.35 MPa.***

The following supply cables must be led to the shaft under the dispenser in addition to the grounding conduits:

- **4-wire cable for powering the three-phase electromotors of vacuum pumps**
  - A harmonized cable of type H05VV5-F 4x1,5 is recommended. This cable is only necessary for fuel dispensers that have the vapor recovery system installed.

- **7-wire cable for switching of pumps located in the tanks**
  - a harmonized cable of type H05VV5-F 7x1,0 is recommended

- **3- or 5-wire cable for powering the electronic counter, switching circuits, and AdBlue® module heating**
  - a harmonized cable of type H05VV5-F 3x1,5 is recommended for dispensers with the LPG or WSE module; a harmonized cable of type H05VV5-F 5x1,5 is recommended for dispensers with the AdBlue® module

- **4-wire shielded cable for data line**
  - a harmonized shielded cable of type H05VVC4V5-K 5x0,5 is recommended

- **3-wire cable for STOP button safety circuit**
  - A harmonized cable of type H05VV5-F 3x1,5 is recommended. This cable is only required in dispensers with an LPG module operating in the standalone mode.

Pressure system dispenser foundation plans are listed in Appendix 1.2.

CAUTION ***Only cables that meet the requirements of the European norm EN 13617-1:2012 may be used as the supply cables. Among the basic attributes of these cables is the resistance to oil, petrol and petrol vapors (according HD21 13S1).***

3.3.8. SATELLITE DISPENSER

A "satellite" dispenser can be attached to all OCEAN type fuel dispensers. It is an extra dispensing site – a column with a dispensing hose and nozzle placed on the other side of the refuge island. A satellite can be used to refuel trucks, having the hoses of the main dispenser and the satellite fill both side tanks in one truck at the same time. The satellite dispenser has no own control electronics or hydraulics and it is fully dependent on the master dispenser. An image of a satellite, its layout and base frame can be seen in Appendix 1.

3.4. MECHANICAL ATTACHMENT OF THE DISPENSER

The dispensers are attached to special base frames with anchoring bolts supplied along with the dispensers. The dispenser's base frame is not part of the standard dispenser equipment, but it can be ordered additionally. The base frame is set in concrete to the refuge island, then the front and rear covers of the dispenser are removed, place the dispenser on the base frame and fix with the bolts.

CAUTION ***Due to safety and environmental protection it is necessary to install a leakage tray under the dispenser to avoid leakage of fuel.***

Subsequently, the dispenser is connected to the suction piping using a flexible pipe (suction piece), which is part of the dispenser delivery. Appendix 1 includes the base frames and layouts of all dispenser types with marked location of the suction piping and petrol vapor recovery pipes from the dispensers. The delivery piping of vapor recuperation is connected to the piping with a lid G 1".

NOTE *The G 1" lid is part of the dispenser delivery.* ***The recuperation piping must end with an internal thread G1".***

ATTENTION->LPG ***Driving LPG out of the fuel dispenser and its piping, e.g. during dispenser disassembly, is carried out by nitrogen or an inert gas. Driving LPG out by air or oxygen is prohibited!***

NOTICE->LPG *According to the norm EN 14678-1:2013, section 4.5.1.2, the inlet of the liquid phase and the*

outlet of the gaseous phase of the dispenser must be protected by a device (shear valve or breaking point), which will ensure, in case of a pipe fracture, the interruption of LPG fluid or LPG gases into the air. The shear valve or breaking point must be firmly attached to the dispenser or to the ground. ***Shear valves are not part of the standard supply package of LPG dispensers!***

3.5. ELECTRIC WIRING OF THE DISPENSER

Electric wiring of the OCEAN fuel dispensers requires protection against contact voltage (according to the norm ČSN 33 2000-4-41 "Electro-technical regulations - Electrical equipment - Part 4: Safety - Chapter 41: Protection against electrical shock", published: August 2007, which complies with the international norm HD 60364-4-41:2007) and also requires that appropriate electrical cables must be connected to each dispenser.

It is imperative that all fuel dispensers at the station be interconnected with a grounding conduit and connected to a grounding system. For the grounding conduit, a green-yellow conduit of at least **4 mm^2** cross-section or a special flat conduit may be used. The grounding conduit must be connected to a central grounding clamp of the fuel dispenser located in its base (bolt M10), identified with a ground mark.

ATTENTION *All the electrical cables must be chemically resistant and must have good insulation attributes, because they will be under long-term influence of an aggressive, explosive environment. In dangerous environments it is* ***only allowed to use power and data lines that satisfy the requirements of norms EN 60079-14 and EN 50525-2-51, or EN 60079-14 and EN 50525-2-21****. For these purposes, the manufacturer recommends using harmonized cables of type H05VV5-F and H05VVC4V5-K. Examples of electric wiring of fuel dispensers in pressure models are shown in* ***Appendix 2.2.*** *and of distribution box wiring in* ***Appendix 2.3.***

NOTE *To allow for easy installation (cable ending in a distribution box) it is required that all cable terminations entering the fuel dispenser have sufficient length – each end at least* ***3 m*** *above the ground.*

Concerning the used voltage and function, the cables can be divided into power (supply) cables and signal cables.

Power cables:

- powering of electric motors of pumps and vacuum pumps
- powering of counters and power switches
- switching of pumps of the LPG, WSE, and AdBlue® dispensing modules and submersible fuel pumps (pressure versions of dispensers)

Signal cables:

- Communication line (Data line)

- Additional service and safety lines (STOP signal, pulse outputs, motor blocking, tank fuel level probes etc.)

3.5.1. POWERING OF ELECTROMOTORS OF PUMPS AND VACUUM PUMPS

The power supply to electromotors of pumps and vacuum pumps in all types of combined dispensers is carried out by a 4-core cable H05VV5-F 4x1,5 (see Table 3), which leads from the main distributor in the kiosk to each fuel dispenser to its distribution supply box see Appendix 2. In the distributor the cable is connected to circuit breakers and a switch. Switching of individual motors of pumps and vacuum pumps is done by means of contactors inside the fuel dispenser.

All OCEAN fuel dispensers have contactors and each motor in the dispensers is protected with a thermal residual current device. Switching of motors of pumps and vacuum pumps is made so that at any given moment, no more than two motors of pumps and two motors of vacuum pumps are connected to the power supply cable.

Table 3 – Marking of wires in a cable powering the electro motors of pumps and vacuum pumps

Marking of wires in the cable H05VV5-F 4x1,5		
marking	color	description
L1	black 1	phase 1
L2	black 2	phase 2
L3	black 3	phase 3
PE	green-yellow	protective

NOTICE *For the termination of the supply cable 3x400V in the distributor we recommend using a special engine circuit breaker, type **PKZM 0-10**, from the company Moeller Klöckner. This circuit breaker serves as a switch and also contains short circuit and thermal protection. After installation in the distributor's door this circuit breaker can be complemented with a control head (IP65) with an extended spindle – type RH-PKZO.*

NOTE *For switching of motors of pumps and vacuum pumps in the dispensers, there are motor contactors **DIL EEM-10** and **DIL EM-10-GI** with thermal residual current protection of type **ZE-2.4** and **ZE-0.6** from the company Moeller Klöckner, or motor circuit breakers of type **PKZM 0-0.4** from the same producer. Fig. 13 shows the reaction times of the used residual current devices of type ZE.*

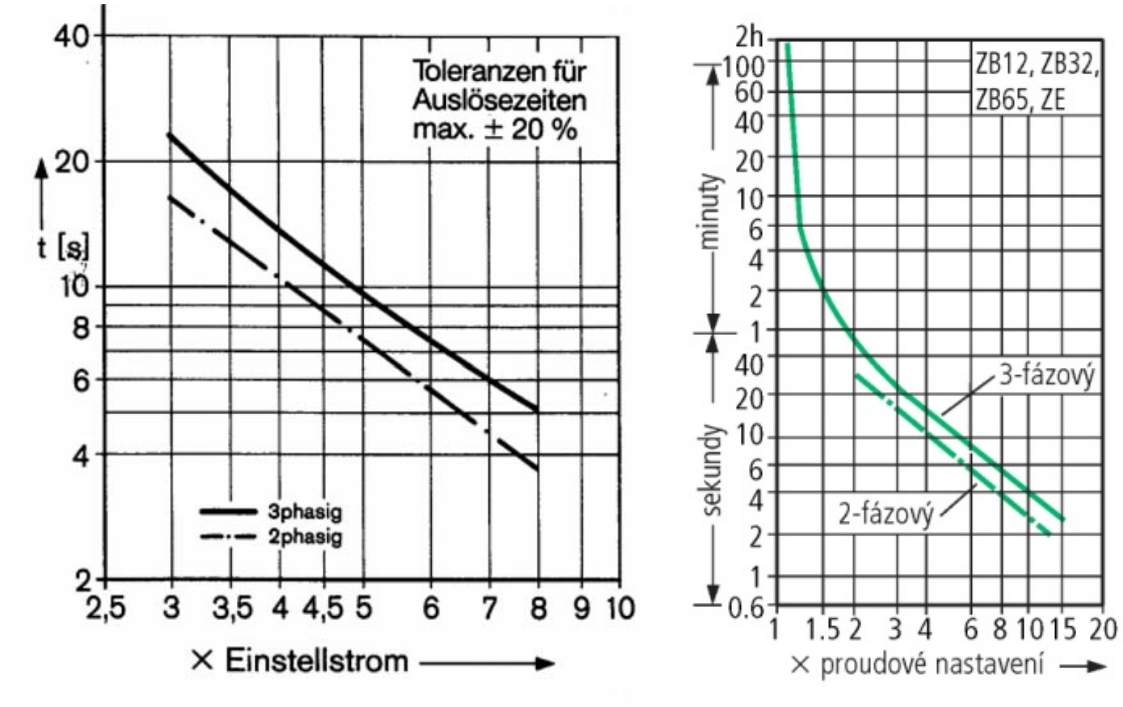


Figure 29 – Reaction times of the motor residual current devices of the ZE type

Electromotor parameters

Table 4 provides basic parameters of two electromotor types used in the OCEAN fuel dispensers.

Table 4 – Electromotor parameters

Pump electromotor	Vacuum pump electromotors
1MA7083-4BA10-8N51	BA240TRII AR-R
asynchronous motor	asynchronous motor
230/400V; 50Hz	230/400V; 50Hz
current 2.05 A	current 1.1 A
consumption 0.75 kW	consumption 0.37 kW
1395 RPM	2840 RPM
Ia/In = 4,8	with internal thermal protection
IP 55	IP 54
T3, t_E = 16 sec	T3
cos ϕ = 0,75	cos ϕ = 0,8
Ex II 2 G Ex e II T3	Ex II 2G Ex d IIB T3
PTB 01 ATEX 3335X/03	ISSeP 08 ATEX 041X

NOTICE *After connecting the power supply to the electromotor, check the proper direction of its turning! The proper direction is marked by the arrow on the pump's belt – see Figure 30.*

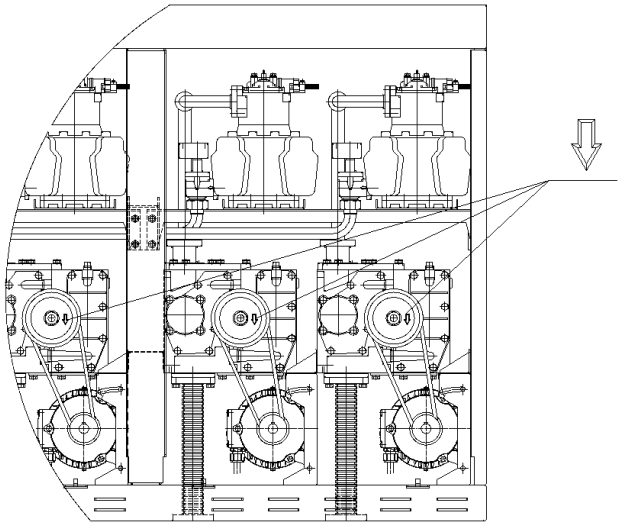


Figure 30 – Checking the direction of the pump motor revolution – see the arrow

3.5.2. POWER SUPPLY TO THE ELECTRONIC COUNTER, SWITCHING ELEMENTS AND HEATING

The counter and the switching circuits are powered in combined dispensers with the LPG or WSE module by a **3-core power cable type H05VV5-F 3x1,5** (see Table 5) and in combined dispensers with the AdBlue® module by a **5-core power cable type H05VV5-F 5x1,5** (see Table 6). The powering cable leads from the main distributor in the kiosk to the first module of the fuel dispenser, in its power supply distribution box. From the distribution box the power is led to the head of the dispenser's electronics, where it ensures stabilized power supply to the electronic counter, switching elements and to any heating units.

Table 5 – Marking of conductors in the cable of the counter and switching elements power supply (combi dispenser LPG or WSE)

Marking of conductors in the cable H05VV5-F 3x1,5		
marking	color	description
L	black	phase
N	blue	neutral
PE	green-yellow	protective

Table 6 – Marking of conductors in the cable of the counter and switching elements power supply (combi dispenser AdBlue®)

Marking of conductors in the cable H05VV5-F 5x1,5		
marking	color	description
Ls	black	phase
Ns	blue	neutral
Lt	brown	heating phase
Nt	blue	neutral
PE	green-yellow	protective

Power for the counter leads from the dispenser to the main distributor, where it is connected via a circuit breaker 230V (230V, 6A) to a bus shared by all the fuel dispensers. From there the power for all dispensers leads to a stabilized backup power source, which can power the dispenser's counter for 3-5 minutes in case of a power blackout.

NOTICE *To ensure trouble-free operation of the fuel dispensers, the producer recommends to backup the stabilized power supply for the dispensers with a backup power source UPS (Uninterruptible Power Supply). Power blackouts, strong interference or voltage drops during voltage peaks are frequent phenomena in the electricity grid (especially in winter). All these problems can be eliminated by the use of a proper power backup UPS. There are essentially two types of power backups suitable to provide backup power for the dispensers:* ***UPS of the line-interactive type*** *and* ***UPS of the on-line type****. Fuel stations connected to a stable electricity grid (without voltage drops and interference) can do with the line-interactive UPS type to stabilize their power supply. In other cases there must be used the on-line UPS type. Interference, voltage drops or blackouts can cause frequent blocking of the dispensers, errors in the communication between the computer and the dispensers, computer errors (data loss) etc.*

3.5.3. SWITCHING OF PUMPS OF MODULES AND FUEL PUMPS OF THE PRESSURE SYSTEM

Remote switching of pumps of additional dispensing modules LPG, WSE and AdBlue® in combined dispensers is carried out in the suction model by a **3-core power cable type H05VV5-F 3x1,5** (see Table 7) and in combined dispensers in the pressure model by a **7-core power cable type H05VV5-F 7x1,0** (see Table 8). The powering cable for switching leads from the main distributor in the kiosk to the first module of the fuel dispenser, in its power supply distribution box. From the distribution box the power is led to the head of the dispenser's electronics, where it is connected to power relays ensuring the switching of LPG, WSE, AdBlue® dispensing modules or of submersible fuel pumps in the pressure system.

Table 7 – Marking of conductors in the cable for switching of module pumps (suction dispenser model)

Marking of conductors in the cable H05VV5-F 3x1,5		
marking	color	description
SC	black 1	shared conduit
S1	black 2	switching phase
PE	green-yellow	protective

Table 8 – Marking of conductors in the cable for switching of module pumps (pressure dispenser models)

Marking of conductors in the cable H05VV5-F 7x1,0		
marking	color	description
SC	black 6	shared conduit
S5	black 5	switching phase 5
S4	black 4	switching phase 4
S3	black 3	switching phase 3
S2	black 2	switching phase 2
S1	black 1	switching phase 1
PE	green-yellow	protective

NOTE *For switching of pump motor contactors the dispenser uses relays or motor contactors. The switching voltage on the contacts should not exceed **250V** and the switching current **1A**.*

3.5.4. DATA (COMMUNICATION) LINE

The data line serves to control the fuel dispenser and to transfer data from the dispenser remotely, when the dispenser is in the automated mode. The dispenser is controlled with a single purpose console, a station controller, or directly by a computer in the fuel station kiosk. If the dispenser operates in manual mode only, this data line doesn't need to be installed.

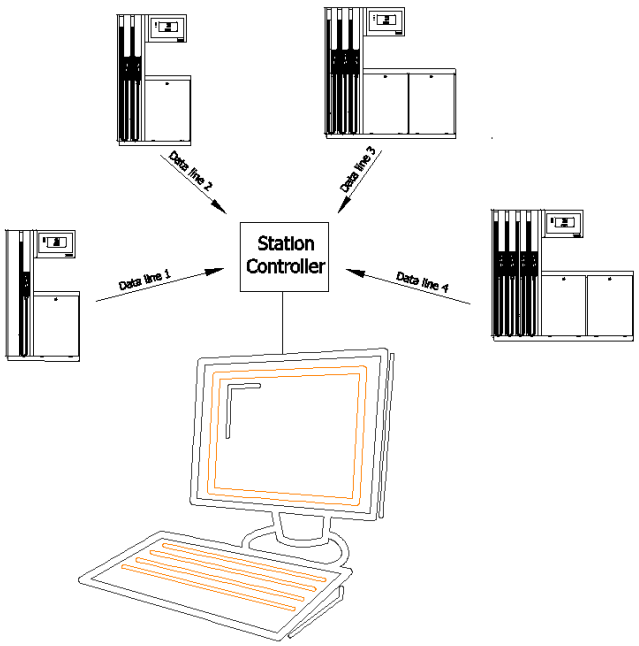


Figure 31 – Radial layout of data lines from dispensers

To install a data line it is necessary to lead a 5-core shielded communication cable **H05VVC4V5-K 5x0.5** (see Table 9) to each fuel dispenser. The data cable must lead radially from the fuel station control room (kiosk, control panel) to the first module of each fuel dispenser, into its communication distribution box XS01. From the communication distribution box, the data line is lead into the head of the dispenser's electronics and connected to its counter.

Table 9 – Marking of conduits in the data line

Marking of conductors in the cable H05VVC4V5-K 5G0.5		
marking	color	description
SH	shielding	shielding
-	black 5	reserved
-	black 4	reserved
-	black 3	reserved
B	black 2	data B
A	black 1	data A

NOTICE *For the communication line the manufacturer recommends using a **5-core shielded data line with a minimum conductor cross-section of 0.5 mm^2**. The cable jacket must be self-extinguishing and resistant to petrol vapors. For these purposes, the manufacturer recommends using harmonized cables type H05VVC4V5-K.*

As a standard, OCEAN dispensers are equipped with a PDE data line, which is an RS485 line with the PDE communication protocol. At the customer's request it is possible to complement the dispenser's counter with a data converter, which converts the PDE data line to a line of a different type and different communication protocol, such as PUMA LAN, ER4, IFSF-LON, TATSUNO Party Line etc. This also changes the purpose of conduits in the data line. The markings of conductors in the most common data line types are shown in Table 10.

Table 10 – Marking of conduits for various kinds of data lines

Marking of conductors in the cable H05VVC4V5-K 5x0.5 for various kinds of data lines							
conduit color	PDE	Easy Call	PUMA LAN	PUMA LAN + probes	ER4	DART	ACTL
shielding	ST	ST	ST	ST	ST	ST	ST
black 5	reserved	reserved	unused	LL1	reserved	reserved	reserved
black 4	reserved	reserved	0V	LL0	ZB	reserved	Rx-
black 3	reserved	0V	AM	GND	YB	reserved	Rx+
black 2	B	D(+)	RX	RX	ZA	B	Tx-
black 1	A	D(-)	TX	TX	YA	A	Tx+

NOTE *For some types of data lines, a 2-core or 3-core cable would be sufficient – see Table 10. However, because the data line type may change during operation, depending on the used control system, **we recommend using a 5-core cable**.*

3.5.5. SERVICE LINES

Service lines are for special purposes. These lines are not necessary for the own operation of the dispenser, but are used in situations when selected functions of the dispensers are to be controlled remotely or when some signals need to be transmitted out of the dispenser. Always consult the technicians of TATSUNO EUROPE a. s. whether the service line installation is necessary. For service lines we recommend using multi core shielded cables type H05VVC4V5-K (0,5 mm^2).

3.5.6. SAFETY LINE (STOP BUTTON)

The safety line serves to lead the signal from the STOP button, located in the dispenser, to the safety circuits of the station distributor. The safety line must be installed in dispensers with the LPG module that work in the unattended mode. Pressing the STOP button on the dispenser activates the safety circuits, which in turn disconnect the dispenser from the power supply and close the safety valves on the input piping of the LPG dispensing module, both for liquid and gas phases.

For installing the safety line, it is necessary to lead a **3-core power cable H05VV5-F 3x1,5** (see Table 11) to each dispenser. The safety line cable is lead from the main distributor in the kiosk to the first

dispenser module into the distribution box. From the distribution box it continues into the dispenser electronics head, where it is connected to the STOP button.

Table 11 – Marking of conduits in the safety line

Marking of conductors in the cable H05VV5-F 3x1,5		
marking	color	description
ST	black 2	STOP signal
ST	black 1	STOP signal
PE	green-yellow	protective

3.5.7. CABLE CHARACTERISTICS

For the installation, it is necessary to use cables that are resistant to common chemicals, oils and which have sufficient thermal and mechanical resistance. These are attributes are met for instance by H05VV5-F and H05VVC4V5-K harmonized cables. The main characteristics of cables are listed in Table 12.

Table 12 – Cable characteristics

Cable type	Function	No. of cores	D_{Anom} [mm]
H05VV5-F 4x1,5	motor powering	4	8.2 – 10.2
H05VV5-F 7x1,0	Switching of pumps	7	9.5 – 11.8
H05VV5-F 3x1,5	Counter powering, module pump switching, safety line	3	7.4 – 9.4
H05VV5-F 5x1,5	Counter powering with heating	5	9.1 – 11.4
H05VVC4V5-K 5x0,5	Data line	5	10.1

Legend: D_{Anom} – cable outer diameter

NOTICE *The dispensers' distribution boxes use cable glands M20 x 1.5 with anti-explosion treatment with protection of type Ex II 2G EEx e II and IP65 covering. These cable glands have a permitted range of cable cross-section (D_{anom})* ***from 7.0 mm to 12.0 mm. It is prohibited to use cables with cross-section outside the permitted range!***

NOTICE->LPG *Every LPG dispensing module must be secured with an electrical device equipped with a stop function according to Category 0 or 1 in EN 60204-1. Attendants of the fuel station must be familiarized with this function.*

NOTICE *Impulse surges can form in any conduit as a result of lightning within a distance up to several kilometers or due to industrial activities. The strength of the impulses due to induction from lightning is enough to completely destroy an electronic apparatus. Consequently, dispensers contain surge protection that leads the overvoltage impulse energy to a grounding conductor and thus protects the given electric appliance. The producer of the dispensers* ***recommends*** *protecting the main distributor (or the secondary distributor), which powers the dispensers, electronic equipment (computer, cash desk etc.) and data lines with overvoltage protections and lightning arresters.* ***The producer does not provide any warranty for damage caused due to insufficient protection of the cables!***

NOTICE *For trouble-free operation of the fuel dispensers it is **necessary** to separate signal cables from power supply cables. If there are power cables near the signal cables, interference and undesirable parasite phenomena arise and this may cause problems with the control of the dispensers or even destroy the electronic appliances installed in the dispensers and in the kiosk. Any crossing or shared installation (in a single cluster) of signal and power cables must therefore be avoided. This can be solved by putting signal cables and power cables into their own "channels" (metal pipes). **The producer does not provide any warranty for damage caused due by improperly solved cable connections!***

4. BASIC FUNCTIONS AND SETTINGS OF DISPENSERS

The setup of fuel dispensers is carried out by means of a set of setup parameters that regulate the functional parameters of the dispenser and which can change the mode and behavior of the dispenser in various situations. According to the type of the installed electronic counter, parameter values can be viewed and changed by a remote IR (infrared) controller, a service keyboard or by the keys on a pre-set keyboard on the dispenser.

The setup method of the dispenser differs depending on the counter in the head of the dispenser. The following chapter describes the basic functions and setup procedures for the counters PDEX and TBELTx.

4.1. PDEX COUNTER

The electronic counter PDEX for fuel dispensers made by the company TATSUNO EUROPE a.s. is set up by a remote IR controller. Service technicians authorized by the dispenser producer use the yellow service remote controller PDERT-5S, which allows full setup of all parameters of the dispenser. Managers of fuel stations use the white remote controller PDERT-5O, which enables:

- reading of non-resettable liter totalizers of all dispensing hoses
- reading and reset of daily electronic liter and currency totalizers of all hoses
- setting of individual product prices (in case of manual operation)
- reading and setup of the dispenser's operating parameters

The setup mode can be triggered in the dispenser by the above method only while the fuel dispenser is idle – i.e. when fuel pumping has been completed, all nozzles are hung in their nozzle boots and all sales (transactions) have been completed. There are two access modes:

- ***Operator mode***, intended for fuel station staff – allows only reading of values from the electronic totalizers and values of the basic parameters of the dispenser. The values cannot be changed or reset.
- ***Manager mode***, intended for the fuel station manager – allows not only reading of values from the dispensers, but also resetting the daily totalizers and setting basic operational parameters of the dispensers. Access to the manager mode is protected by a password.

4.1.1. PDERT REMOTE CONTROLLER DESCRIPTION

Dispensers with a PDEX counter must be controlled by an IR remote controller to read values from the dispenser's displays (totalizers), to change the dispenser's operating mode or to set various parameters of the counter. The keyboard of the remote controller has the following keys and layout (Figure 32):

Figure 32 – Description of keys on the remote controller PDERT-5O

When using the IR remote controller, the controller must be approx. 1 meter from the centre of the fuel dispenser display – see Figure 33. The setup mode is triggered by the <R> key (manager mode), or by the consequent pressing of the keys <S> and <R> (operator mode). The values to be set or read are shown on the display. During reading of the electronic totalizers, the dispenser parts marking rules described in Figure 33 apply.

NOTE *Except setting up and reading of values, the keys A1, A2, L1, L2 and CLEAR can also be used to setup the options on the dispenser. The ON key allows testing of the function of display heating. The key <0> allows the unblocking of a dispenser after an error in the operating mode, which ensures blocking after refueling.*

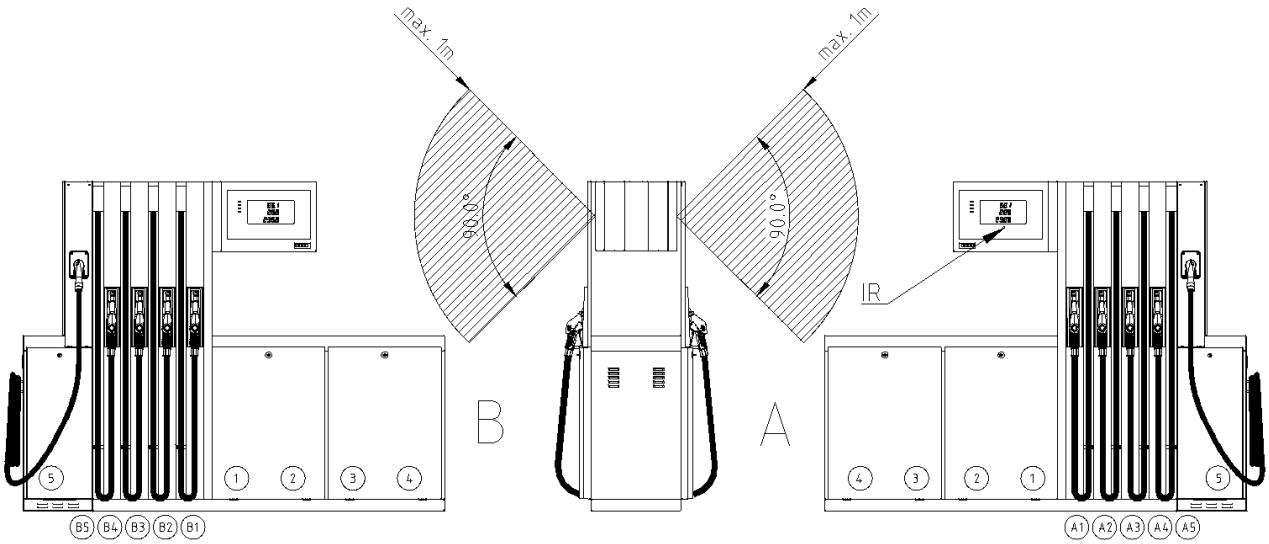
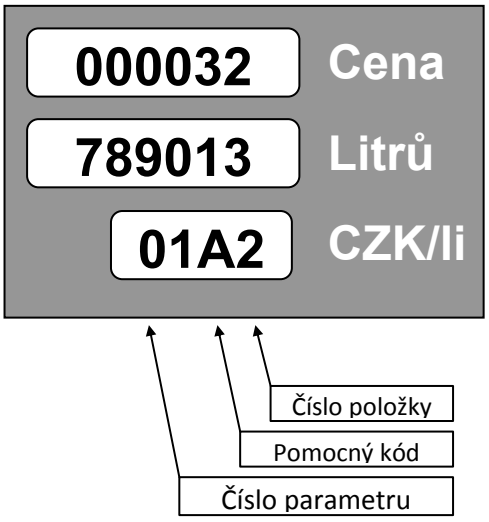


Figure 33 – Range of the remote control and marking of hoses and products of the dispenser

4.1.2. DISPLAYING DATA IN THE SETUP MODE

All data in the Setup mode are displayed in the fuel dispenser's display. When using the remote control, the data is shown in the display of the side from which the setup mode was triggered. The individual parameters are shown in the display as follows:



Parameter No.: 01
Item No.: 2 (dispensing hose order)
Auxiliary Code: A (dispenser side)
Parameter Value: 327890 13 (volume in centiliters)

4.1.3. OPERATOR MODE

The Operator mode is triggered by pointing the IR remote controller at the fuel dispenser's display (at a distance approx. 1 m from the dispenser's display centre), pressing the button <**S**> and consequently <**R**>. **All nozzles of the dispenser must be hanged in the nozzle boots and the sale at the dispenser must be completed (paid) before triggering.**

After initializing the Operator mode, the value of the first parameter is displayed. To navigate to the following parameters and their items, use the keys <**>**> and <**+**> (see Figure 32).

The Operator mode allows displaying, **but not changing**, the value of the parameters shown in Table 13.

Table 13 – List of parameters for the Operator mode setup

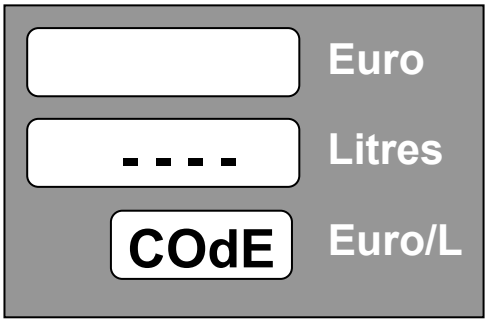
Parameter	Description
01	Non-resettable volume totalizers
02	Daily volume and amount totalizers (resettable)
03	Unit price of products (in manual mode)
04	Current time and date
05	Program version and check sums
06	Error message history
07	Latest deliveries history

Individual parameters will be described in the following chapter.

The operator mode can be terminated by pushing the <**R**> button. The mode also gets terminated automatically if no remote controller button is pushed in 60 seconds.

4.1.4. MANAGER MODE

Use the remoter controller (from a distance of approx. 1 m from the dispenser's display centre) and push the button <**R**>. **All nozzles of the dispenser must be hanged in their nozzle boots and the sale at the dispenser must be completed (paid) before starting.** After triggering the Manager mode, the display will ask for a 4-digit access password:



In order to keep the password secret, the input numbers are displayed as dashes only. The factory-set default access password is "1111".

Example:

Press the keys <**1**><**1**><**1**><**1**> and <**ENT**>

NOTE *If the valid password is forgotten, the only remedy is calling an authorized service technician in order to set a new password.*

After entering a valid access password, the display will show the value of the first parameter 01. It is then possible to scroll through the parameters using the <**>**> key or by entering the **search parameter number** and confirming with the key <**ENT**> to directly move to the desired parameter.

The manager mode allows displaying and changing the value of parameters listed in Table 14.

Table 14 – List of parameters in the Manager mode

Parameter	Description
01	Non-resettable volume totalizers
02	Daily volume and amount totalizers (resettable)
03	Unit price of products (in manual mode)
04	Current time and date
05	Program version and check sums
06	Error message history
07	Latest deliveries history
08	Manager mode access password
09	Maintenance history
10	- unused -
11	- unused -
12	Fuel dispenser control mode
13	Error statistics
14	Current operating temperature
15	Reset of the daily totalizers
16	Manufacturer's check number
17	Display backlight intensity
18	Text messages
19	Display segment error

The Manager mode can be terminated by pushing the <**R**> button. The mode also gets terminated automatically when no remote controller button is pushed over 60 seconds.

4.1.5. NON-RESETTABLE VOLUME TOTALIZERS (CODE 01)

Electronic totalizers for all dispensing hoses (nozzles) are stored in the electronic counter memory. These totalizers are ***not resettable*** and they store data about the total volume drawn by the individual hoses.

Table 15 – P01 parameter values description

Parameter	Description
011A	Fuel volume drawn by hose 1 on side A in centiliters (x 0.01L)
012A	Fuel volume drawn by hose 2 on side A in centiliters (x 0.01L)
…	…
015A	Fuel volume drawn by hose 5 on side A in centiliters (x 0.01L)
011B	Fuel volume drawn by hose 1 on side B in centiliters (x 0.01L)
012B	Fuel volume drawn by hose 2 on side B in centiliters (x 0.01L)
…	…
015B	Fuel volume drawn by hose 5 on side B in centiliters (x 0.01L)

NOTE *The number of totalizers shown in parameter P01 depends on the dispenser configuration. The system of hose and product marking in the dispenser is defined in Figure 33.*

4.1.6. DAILY TOTALIZERS (CODE 02)

The electronic daily totalizers for all dispensing hoses (nozzles) are stored in the memory of the electronic counter. **These totalizers can be reset anytime using the P15 parameter** (see description

below). They show the total volume and total amount of money drawn by the individual hoses since their latest reset.

Table 16 – P02 parameter value description

Parameter	Description
02L1 (A)	Fuel volume drawn by hose 1 on side A in centiliters (x 0.01L)
02C1 (A)	Amount drawn by hose 1 on side A in the currency unit
…	…
02L5 (A)	Fuel volume drawn by hose 5 on side A in centiliters (x 0.01L)
02C5 (A)	Amount drawn by hose 5 on side A in the currency unit
02L1 (B)	Fuel volume drawn by hose 1 on side B in centiliters (x 0.01L)
02C1 (B)	Amount drawn by hose 1 on side B in the currency unit
…	…
02L5 (B)	Fuel volume drawn by hose 5 on side B in centiliters (x 0.01L)
02C5 (B)	Amount drawn by hose 5 on side B in the currency unit

NOTE *The number of daily totalizers shown in parameter P02 depends on the dispenser configuration. The system of hose and products marking in the dispenser is defined in Figure 33.*

4.1.7. UNIT PRICES OF FUEL PRODUCTS (CODE 03)

This function enables displaying and setting of the current unit price (i.e. the price of one liter of fuel) for all fuel products. These fuel unit prices are set on the display after the nozzle is lifted and the display is reset, in case the dispenser works in **manual mode**.

Setup is carried out by pushing the <**Ent**> key, entering the price in the PPPP format and confirming with the <**Ent**> key again. A decimal point is not used. For instance, the price 1.03 Euro/L will be written as 0103, etc.

Table 17 – P03 parameter value description

Parameter	Description	Default setting
03 1	Unit price of fuel product 1	0,000 EUR / L
03 2	Unit price of fuel product 2	0,000 EUR / L
03 3	Unit price of fuel product 3	0,000 EUR / L
03 4	Unit price of fuel product 4	0,000 EUR / L
03 5	Unit price of fuel product 5	0,000 EUR / L

NOTE *The number of fuel products listed in parameter 03 depends on the dispenser configuration. The system of fuel product marking is described in Figure 33. When the unit price setting is changed, it will take effect only after the subsequent lifting of the nozzle.*

NOTICE *The values set in the P03 parameter are valid **only in the dispenser's manual mode**. If the fuel dispenser is connected to the station's central control system, the fuel unit price is set directly by the control system prior to every fuel delivery. The P03 parameter value is not functional in this case.*

NOTICE *The fuel dispenser **does not allow dispensing for zero value of the unit price**. In such a case, after lifting the dispensing nozzle, the display of the dispenser will show the error message E30 and will not start pumping.*

4.1.8. CURRENT TIME AND DATE (CODE 04)

This function allows displaying and setting the current time and date. The first line of the display shows the time in the format “HHMMSS” (hours, minutes, seconds), the second line shows the date in the format „DDMMYY” (date, month, year) – for example: 15:35:11, 24. 12. 2011. Setting is made by pressing the <**Ent**> key, entering the time/date in the proper format and confirming by pushing <**Ent**> again.

Table 18 – Description and setting of the P04 parameter value

Parameter	Description	Default setting
04 1	Setting the date – format DDMMYY (e.g. 241211 = 24. 12. 2011)	1.1.2001
04 2	Setting the time – format HHMMSS (e.g. 153511 = 15:35:11)	0:00:00

NOTE *The time and date is displayed in the graphic proportional display and it is used in the parameters P06 and P07 to record the time of errors and time of fuel pumping completion.*

NOTICE *48 hours after an interruption of power supply to the fuel dispenser, the internal clock is reset. The time and date values will change to the default setting and must be set to the current date again!*

4.1.9. DISPLAYING THE PROGRAM VERSION AND CHECK SUMS (CODE 05)

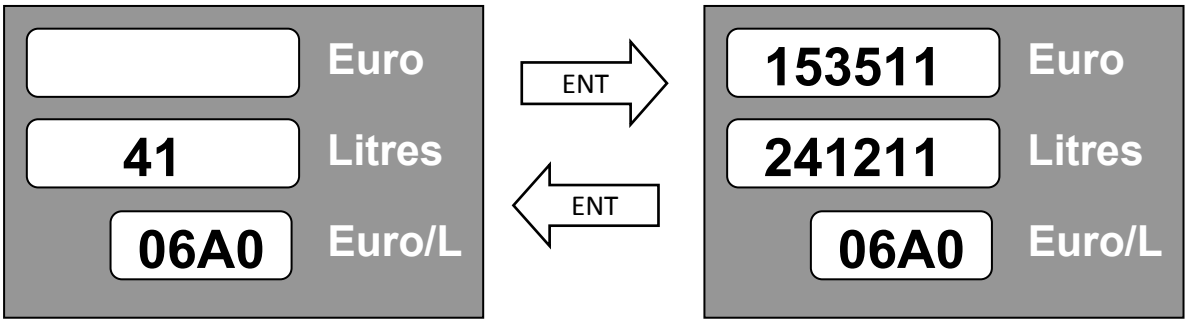
This function shows the dispenser counter program version number and various check sums. These values serve for inspecting metrology authorities and authorized service technicians.

Table 19 – P05 parameter values description

Parameter	Description
05 1	Program version + edition (e.g. 1.03 + 7)
05 2	Check sum W&M (20260)
05 3	Check sum of the program (e.g. 52359)
05 4	Check sum of the memory of parameters P20-P99 (e.g. 34567)
05 5	Check sum of the appliance for thermal compensation (e.g. 47644)
05 6	Time and date of program creation (e.g. 19. 07. 2011, 07:56:17)

4.1.10. ERROR MESSAGE HISTORY (CODE 06)

This function serves to show the history of the last ten error messages for malfunctions of the fuel dispenser. The error message table can be found in Chapter 6.2.1.



After opening the parameter P06, the display will show the code of the last error message on side A of the dispenser (e.g. 41 - E41 hose 1A pulser error, see Error message table in Chapter 6.2.1). After pushing the <**ENT**> key time and date of error occurrence is displayed. After pushing the <**+**> key, the display shows the code of the last error message of side B of the dispenser. See more in Table 20.

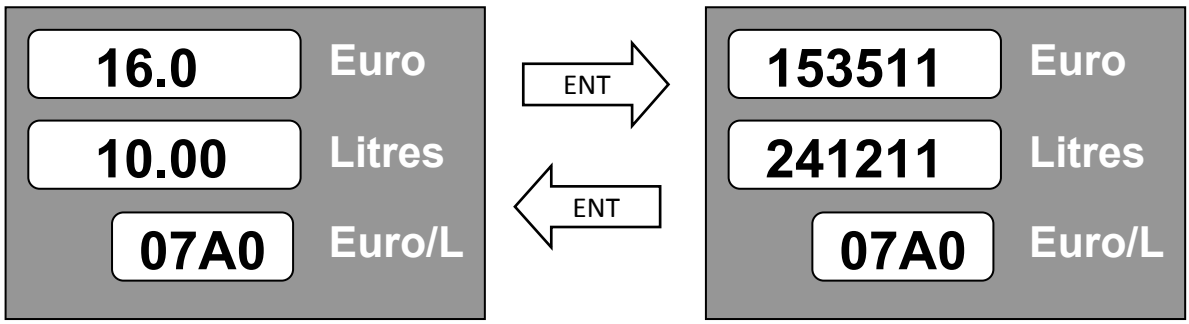
Table 20 – P06 error messages history

Parameter	Description
06A0	Code of the last error of the dispenser on side A
06B0	Code of the last error of the dispenser on side B
…	…
06A9	Code of the tenth recent error of the dispenser on side A
06B9	Code of the tenth recent error of the dispenser on side B

NOTE *If there are two errors of the same type and error code immediately after each other, only the last one will be stored in the counter memory.*

4.1.11. LATEST DELIVERY HISTORY (CODE 07)

This function serves to show the history of the last 10 fuel deliveries (transactions) on each side of the dispenser. This parameter has the following data layout on the display:



After opening the parameter P07, the display will show the code of the latest fuel delivery on side A of the dispenser (example: 16 EUR / 10 L). The price per liter alternates in the display with the parameter number. After pushing the <**ENT**> key the time and date of fuel delivery completion is displayed. After pushing the <**+**> key, the display shows the code of the last error message of side B of the dispenser. See more in Table 21.

Table 21 – P07 last fuel deliveries history

Parameter	Description
07A0	Last fuel delivery on side A of the dispenser
07B0	Last fuel delivery on side B of the dispenser
…	…
07A9	Tenth most recent fuel delivery on side A of the dispenser
07B9	Tenth most recent fuel delivery on side B of the dispenser

NOTE *If the memory bank for fuel deliveries history is empty, i.e. there is no data stored in the memory, the display will only show "------".*

4.1.12. ACCESS PASSWORD TO THE MANAGER MODE (CODE 08)

This function allows displaying and/or changing the access password to the Manager mode.

The default access password set from the factory is "1111".

4.1.13. MAINTENANCE HISTORY (CODE 09)

This function allows displaying the codes of the latest 10 service remote controllers used to set parameters of the counter.

4.1.14. OPERATING MODE OF THE FUEL DISPENSER (CODE 12)

This function defines the type of the operating mode of the dispenser.

Table 22 – Operating mode of the dispenser P1

Parameter	Description
12 = 0	Automated mode with remote control
12 = 3	Manual mode

The parameter can have a value of either 0 or 3:

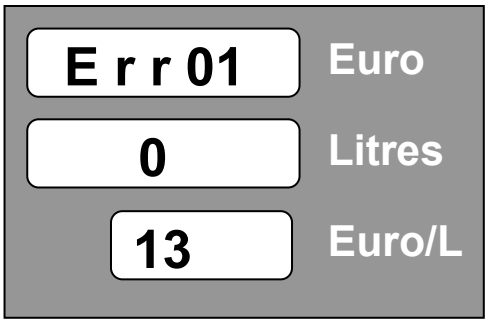
- If the parameter **P12 value equals 0**, the dispenser operates in a purely automatic mode, i.e. is connected to the control computer via a data line. The dispenser is fully controlled by a remote control unit (counter, control panel, etc.) – release of the dispenser for fuel pumping, blocking of the dispenser, setting the fuel price and the maximum amount/volume for each pumping etc. Shortly after interruption of communication between the computer and the dispenser, the display will show the error message E18. Once the communication is restored, the E18 error message disappears.
- If the parameter **P12 value equals 3**, the dispenser operates in a purely manual mode. The dispenser is fully independent – not remotely controlled. The data line is blocked. The unit price of the fuel is controlled by the P03 parameter. Unless a special manual mode with blocking after fuel drawing or a mode with the RELEASE signal controlling is set, the fuel pumping starts immediately after the nozzle is lifted and the display reset.

4.1.15. ERROR STATISTICS (CODE 13)

This function displays the statistics about the errors that occurred on the dispenser since its initialization or counter reset. This parameter has a different data layout in the display:

The first line of the display shows the dispenser error code – 01 through 59, the second line shows the frequency of the error occurrence since the dispenser was commissioned or since a reset of the statistics made by a service technician.

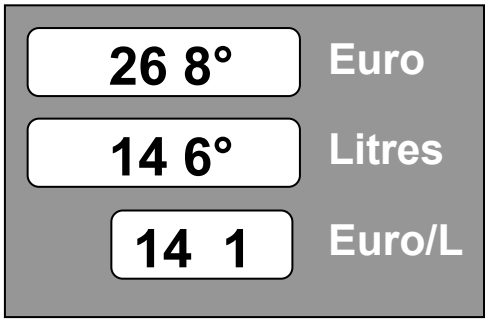
Scrolling through error statistics is possible via the keys <+> and <->. A table showing error messages can be found in Chapter 6.2.1.



4.1.16. CURRENT OPERATING TEMPERATURE (CODE 14)

This function shows the current temperature measured by the thermal sensor located in the processor board of the counter, or the current temperatures of the thermal sensors Pt100 located in the dispenser's hydraulics, if installed.

This parameter has the following data layout on the display:



The first line of the display shows the temperature on the counter's processor board in tenths of degrees Celsius (26.8°C). The second line shows the temperature of the fuel product No. 1 in the dispenser's hydraulic system in tenths of degrees Celsius (14.6°C).

Scroll through the fuel products is carried out by using the <**+**> and <**-**> keys.

Table 23 – Current operating temperature P14

Parameter	Description
14 1	Ambient temperature around the counter's processor and temperature of fuel product No. 1
14 2	Ambient temperature around the counter's processor and temperature of fuel product No. 2
14 3	Ambient temperature around the counter's processor and temperature of fuel product No. 3
14 4	Ambient temperature around the counter's processor and temperature of fuel product No. 4
14 5	Ambient temperature around the counter's processor and temperature of fuel product No. 5

NOTE *The number of fuel products listed in parameter P14 depends on individual fuel dispensers' configurations. The marking system of fuel hoses and products is described in Figure 33.*

4.1.17. RESETTING DAILY TOTALIZERS (CODE 15)

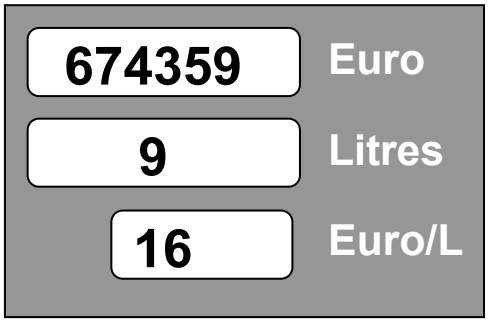
This function serves for resetting all daily totalizers of dispensing hoses/nozzles.

After setting the value of the parameter to **1** and confirming it (<**ENT**> + <**1**> + <**ENT**>), all electronic totalizers that are part of parameter P02 are **reset to zero**.

4.1.18. MANUFACTURER'S LOCK CODE (CODE 16)

This function allows displaying a 6 digit code and entering the manufacturer's lock code, if the dispenser is locked or if it is started in a trial period.

This parameter has the following layout of data in the display:



The first line of the display shows a numeric code (Manufacturer's Lock Code) necessary for unlocking the dispenser remotely. The second line shows the number of days in trial operation, after which the dispenser will be locked.

If the first line is empty and there is 0 on the second line, the dispenser is in standard operating mode.

4.1.19. DISPLAY BACKLIGHT INTENSITY (CODE 17)

This function allows adjusting the intensity of the LED backlight of the graphic proportional display PDEDCU. This parameter does not work with other types of displays.

Table 24 – Display backlight intensity P17

Parameter	Description
17 = 0	Display backlight intensity not regulated
17 = 1-100	PWM value of the display backlight intensity

The standard default setting of the parameter is 70.

4.1.20. GRAPHIC DISPLAY TEXT MESSAGES (CODE 18)

If the dispenser has the graphic proportional display PDECPU, this function allows adjusting the duration of text messages that appear on the screen. Text messages can be classified in two groups:

- display descriptions
- advertising messages

The parameters reserved for the description of the display can have values of 0 or 1. When the value is 0, the message is not shown on the display. When the parameter value is 1, the message is shown.
The parameters reserved for advertising texts can have the values 0, 1, 2 through 9. When the parameter value is 0, the advertising message is not shown on the display, when the value is 1, 2, 3 through 9, the advertising message remains on the screen for 1, 2, 3 through 9 seconds (according to the parameter value). The advertising messages are shown on the display in the order 1, 2, 3 through 9, but only during the time when the dispenser is idle, after the last delivery has been paid. The advertising message disappears as soon as the dispensing nozzle is lifted and delivery starts.
The list of used parameters and their meaning can be seen in Table 25.

Table 25 – Graphic display text messages P18

Parameter	Description	Default setting
18 6	Description of the amount display (e.g. “Euro”)	0 – do not display
18 7	Description of the volume display (e.g. “Litres”)	0 – do not display
18 8	Description of the unit price display (e.g. “Euro/L”)	0 – do not display
18 11	Advertising message No. 1	0 – do not display
18 12	Advertising message No. 2	0 – do not display
18 13	Advertising message No. 3	0 – do not display
18 14	Advertising message No. 4	0 – do not display
18 15	Advertising message No. 5	0 – do not display
18 16	Advertising message No. 6	0 – do not display
18 17	Advertising message No. 7	0 – do not display
18 18	Advertising message No. 8	0 – do not display
18 19	Advertising message No. 9	0 – do not display
18 20	Description in case of pre-selection by amount (e.g. “Eu”)	0 – do not display
18 21	Description in case of pre-selection by volume (e.g. “L”)	0 – do not display

NOTE *Parameter 18 is functional only for the graphic proportional display PDEDCU. For the other types of displays it does not work.*

4.1.21. DISPLAYING THE DISPLAY SEGMENT ERROR (CODE 19)

This function allows switching on/off the displaying of a display segment error (E1) by the processor.

Table 26 – Displaying a display segment error P19

Parameter	Description
19 = 0	The display segment error E1 will not be shown
19 = 1	The display segment error E1 will be shown

The default setting of the parameter value is 1.

4.2. TBELTX COUNTER

The electronic counter TBELTx for fuel dispensers produced, made by the company TATSUNO EUROPE a. s., is setup by means of a 4-key keyboard, or by a pre-set keyboard, if it is installed on the dispenser. This allows the following:

- setup of unit prices of fuel products (in manual operation)
- reading of non-resettable electronic liter totalizers of all dispensing hoses
- dispenser operating mode change

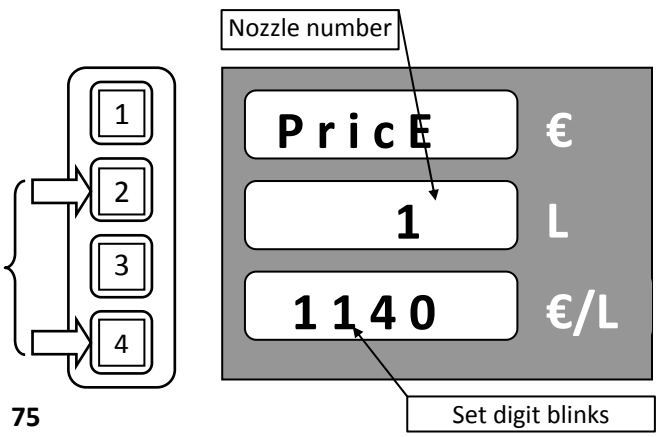
4.2.1. FUEL UNIT PRICE SETTING

If the dispenser is in manual mode, the spent amount calculation uses unit prices of the products stored in the counter memory, where each pump is matched to a single fuel unit price. Any change in the unit price of fuel on the counter's display comes into effect only after the dispensing nozzle is lifted. The factory setting is zero for all fuel products. A non-zero price must be set, otherwise the error message "E30" – "zero price" will be displayed and the fuel delivery will not start. If the dispenser is in the automated mode, the calculation of the drawn amount uses the product unit prices, which are sent by the station's control computer, when releasing every fuel drawing. The prices stored in the P03 parameter of the counter's memory are not functional in this case.

Fuel price setting procedure (manual mode):

The fuel unit price can be changed only in the time between switching the counter's power on and the first fuel delivery from the dispenser.

1. Switch the counter power off and on again.



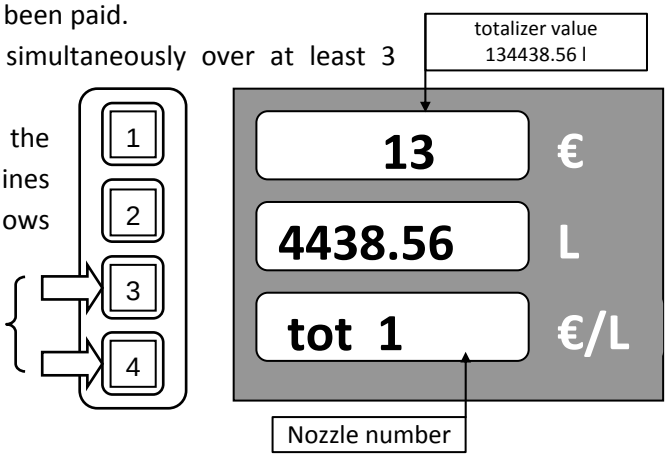
2. Press and hold button 2 along with button 4 over at least 3 seconds.
3. The middle line will display the number of the nozzle (product) being adjusted, the bottom line will display the unit price. The price is set digit by digit. The currently adjusted digit is blinking.
4. Button 1 changes the value of the blinking digit.
5. Button 2 moves from one digit to another.
6. Button 3 allows changing the nozzle number for which the price is adjusted.
7. Price setup is terminated by pushing the button 4.

4.2.2. READING THE ELECTRONIC TOTALIZERS

The TBELTx counter is equipped with electronic volume totalizers for each dispensing nozzle/hose. The value of these totalizers can be found using the pre-set keyboard or by a command sent via the communication line. The totalizers can be reset to zero by means of the P18 configuration parameter. The totalizers can be zeroed only if the SW1-1 switch is in the OFF position.

Electronic totalizers reading procedure:

1. The value of the meters can be shown on the counter's display, only if all nozzles are in nozzle boots and once the last fuel delivery has been paid.
2. Press and hold the 3 and 4 buttons simultaneously over at least 3 seconds.
3. The bottom display line will display the nozzle number. The top and bottom lines show the totalizer values (the top line shows higher digits).
4. The 1(+) and 2(-) buttons allow changing the nozzle number.
5. Totalizer reading is terminated by pushing the 4 (Cancel) button.

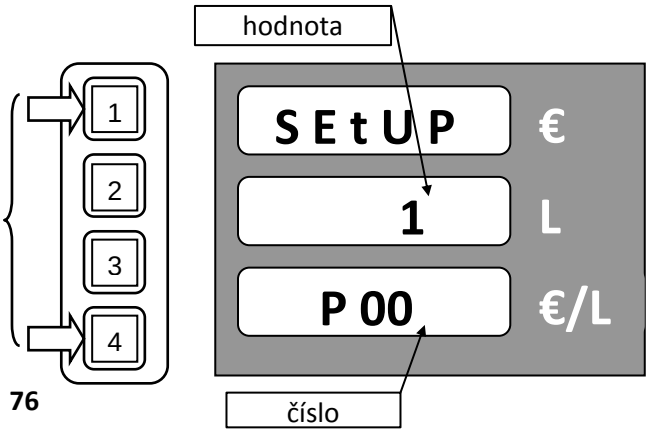


4.2.3. CHANGING THE OPERATING MODE

The fuel dispenser operating mode must be changed when the dispenser needs to be disconnected from the control system (e.g. in case of control system malfunctions), when the dispensers must be operated manually, or vice-versa when the dispenser was operating in the manual mode and needs to be connected to the remote control system.

Operating mode change procedure:

1) Switch the counter power off and on again.
2) During the counter test (countdown to zero) push and hold the 1 and 4 buttons simultaneously until the letter "P" starts blinking on the bottom line. This signals initialization of the setup mode.



3) After finishing the counter test there the P00 parameter number will appear on the bottom line.
4) The middle line displays the current value of this parameter.
5) The parameter is opened for editing by the 3 (Enter) key.
6) After opening the parameter, its value starts blinking.
7) The parameter value can be changed by keys 1 and 2 to the value 0 – automated mode, or to 1 – manual mode.
8) The new parameter value can be stored by pushing the 3 (Enter) key.
9) The parameter setting mode is terminated by holding the key 4 for at least 2 seconds (Cancel).

5. OPERATION

5.1. INSTRUCTIONS FOR SAFE OPERATION

A fuel dispenser is a piece of complicated equipment that must perform many demanding functions. Consequently, before commissioning, cleaning of tanks and pipes must be carried out and the cleanliness of the fuel must be verified. Before commissioning the dispenser, the electric wiring and connections must be reviewed to avoid electric shock and to avoid the risk of explosion.

No smoking

No open fire

Use of cell phones prohibited

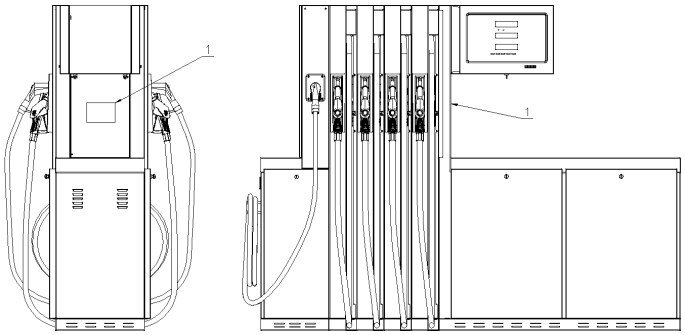


Figure 35 – Recommended placement of the info label (1)

Figure 34 – Info label – Liquid fuels

NOTICE->LPG *Combined dispensers with the LPG dispensing module must be subjected to a pressure test of the LPG dispensing module, along with all piping systems, by a pressure of 2,5 MPa including revision, before commissioning.*

NOTICE->ADBLUE *Combined dispensers with the AdBlue® dispensing module must be subjected to a pressure test of the AdBlue® dispensing module, along with all piping systems, by a pressure of 0,35 MPa, before commissioning.*

WARNING *Dispensers are hygienically safe for the customer and for the operator. During normal maintenance and during fuel delivery it is appropriate to protect the hands for example with gloves made of ecological foil. In case of skin contamination, wash the affected area with soap and water immediately. In case of eye contamination etc., seek medical attention. Avoid inhalation of vapors during dispensing.*

CAUTION

- ⚠ *Smoking and open fires are prohibited in the immediate vicinity of the dispenser.*
- ⚠ *No smoking inside cars.*
- ⚠ *The use of cell phones is prohibited in the immediate vicinity of the dispenser.*
- ⚠ *Dispensing into a vehicle with the engine running is prohibited.*

CAUTION->LPG

- ⚠ *Technical and technological devices must comply with approved conditions, including regulations for safe operation and maintenance, as well as instructions in case of emergency. The device must also be equipped with CO_2 fire extinguishers according to fire emergency requirements.*
- ⚠ *An LPG fuel station may only be operated by persons demonstrably and adequately trained.*
- ⚠ *The dispenser contains a "STOP button" (for cases of emergency); the procedure in case of fire or accidents is exactly specified in the local operation rulebook – the operators must be demonstrably and adequately trained in this sense.*
- ⚠ *The stopping "STOP line" must be situated at least 5 m from the dispenser.*
- ⚠ *LPG tanks, the piping and the dispenser must all be grounded; a marked grounding point must be available for refilling cisterns.*
- ⚠ *During LPG refilling or withdrawing from the tanks, it is necessary to proceed in accordance to issued rules; depending on the current conditions the traffic in the given area of the fuel station must be stopped.*
- ⚠ *It is necessary to follow the set procedure for selling and refilling LPG, and in case of any danger to immediately turn the device off. A fuel station operator must be present at all times during LPG refilling; the refilling may not be carried out in danger of atmospheric discharges during storms.*
- ⚠ *It is necessary to keep the set dates for carrying out regular maintenance controls and revisions of all installed technical devices and not to allow persons without adequate professional qualification to handle the installed equipment, including the gas device.*

CAUTION->ADBLUE®

- ⚠ *Technical and technological equipment must comply with the approved conditions, which comprise instructions for safe operation and maintenance as well as instructions for emergency situations. Snow fire extinguishers must be available close to the AdBlue® dispenser in accordance to fire safety rules.*
- ⚠ *When selling and dispensing AdBlue®, the determined procedure has to be adhered to; in case of any danger the device must be put out of operation immediately.*
- ⚠ *It is necessary to adhere to the set deadlines for regular inspections and checks of the complete AdBlue® dispenser; any intervention by persons without relevant competence, capability and qualification into the installed technology is strictly forbidden.*
- ⚠ *Regular maintenance and service may only be carried out by the authorized service company.*
- ⚠ *The operator shall keep the device in the original safe state; any defect or unusual phenomenon must be reported to the service organization immediately; in case of danger of delayed intervention the device must be put out of operation.*

CAUTION

- ⚠ *The operator may not carry out any repairs of the device nor change the settings of safety fittings. Regular maintenance and service may only be carried out by a certified service company.*
- ⚠ *The operator must keep the device in a proper functional state, immediately report any malfunction or unusual phenomenon during operation to a service company and in case of danger caused by delay immediately put the device out of operation.*

NOTICE->LPG *The LPG module must be secured with an electrical device with a stop function of category 0 or 1 in EN 60204-1. Operators of the fuel station must be familiarized with this device's functions.*

5.2. PUTTING THE DISPENSER INTO OPERATION

Fuel dispensers are switched on and off at the main distribution box of the fuel station, where the power to the dispensers leads. Each fuel dispenser has two power supply points from the main distribution box:

- Power supply of the fuel and vacuum pump electromotors (3x400V)
- Power supply of the electronic counter and switching circuits (230V stabilized)

Both of these supply points are protected with adequate circuit breakers that switch the dispensers off and on.

RECOMMENDATION ***Turning the dispenser on should be carried out as follows:***

- ***Turn on the backup power source (UPS) located in the kiosk (a green light will come up on the UPS).***
- ***Turn on the 230V circuit breaker for stabilized power supply to the electronic counter of the fuel dispenser (an automatic test of all display segments will be carried out and the dispenser's display show the values of the last delivery).***
- ***Turn on the 3x400V circuit breakers of fuel and vacuum pump motors.***

The fuel dispenser is now ready to start dispensing.

5.3. OPERATION OF THE FUEL DISPENSER

NOTICE ***The operation of the fuel station falls under the responsibility of its operator****, who must monitor the progress of dispensing. If a customer at a self-service dispenser violates the required procedures, the operator must inform the customer about the proper manipulation rules. The operator must also mark the fuel station caution zones with warning symbols (no smoking, no open fire, direction of arrival to the dispenser etc.). There must be openly accessible fuel station operation rules on display for the customer, should he or she need any info about the basic requirements.*

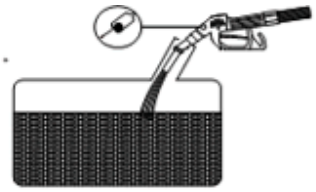
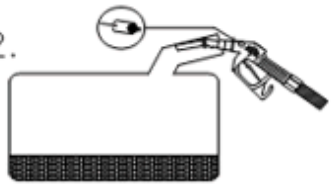
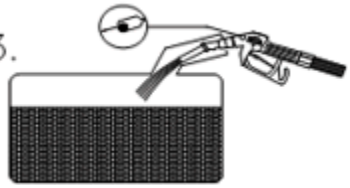
5.3.1. DELIVERY OF FUEL (GASOLINE, DIESEL…), WSE AND ADBLUE®

Putting the fuel dispenser into operation is carried out by taking the nozzle out of the holder (nozzle boot), which also causes a reset of the electronic counter. Then, the electromotor of the pump starts and fuel can be dispensed. The dispensing speed is controlled by the dispensing nozzle lever. Delivery is terminated by closing the nozzle (release of the control lever) and hanging it back to the nozzle boot, which turns off the pump electromotor. The data about the drawn fuel quantity remains on the display until the next times the nozzle is lifter or until the price is paid.

Fuel delivery. The liquid measured by the meter is led to the dispensing hose and dispensing nozzle attached to its end. For self-service fuel stations there are stop-nozzles with a safety shut-off. A control level allows regulating the flow rate up to a complete stop. In the basic version the dispensing nozzle is delivered with a lever arrest. At the customer's request it is possible to supply a dispensing nozzle without the arrest. In this case the lever must be pressed constantly during dispensing. When the lever is released or when the dispensing stop-nozzle falls out of the car fuel tank opening, the flow of fuel stops. The stop-function also activates when the car tank is full when the sensor opening in the nozzle is filled with fuel; the flow will stop even when the control lever is pressed. The safety function also helps against improper handling of the nozzle, i.e. when the outflow extension is pointed more than 15 degrees off the horizontal level, the flow stops even

when the lever is pressed. After the application of the stop-function and safety function, the control lever must be released to automatically revert to its default position.

Table 27 – Positions of the dispensing nozzle during dispensing

1. 	**Proper position of the dispensing nozzle during dispensing** The dispensing nozzle is in an almost horizontal position; the ball does not prevent the flow of air and the fuel flows.
2. 	**Improper position of the dispensing nozzle** The dispensing nozzle is diverted from the horizontal position, the ball stops the flow of air and the fuel stops flowing.
3. 	Since the orifices of fuel tanks of various cars differ, you must find the optimum position for the dispensing nozzle when the fuel still flows. The fuel flow may be turned off also when the fuel stream flowing out of the nozzle hits the wall of the car fuel tank orifice. In that case you need to find a different position.

5.3.2. DELIVERY OF LPG

Before commencing the delivery, the fuel station operator verifies that the fuel tank in the vehicle has a homologation sign and that the vehicle's motor and all electrical appliances are turned off. Next the operator visually checks the state and wear of the filling opening, which could potentially cause a gas leak. If he/she finds any deficiencies, he/she is authorized to refuse refueling a tank. In case of fuel leakage or danger, the operator terminates the delivery.

Delivery of LPG into motor vehicles with operator

The service of the dispenser is carried out by the operator of the fuel station, who releases the dispensing nozzle from the dispenser and connects it to the tank of the vehicle, which must be secured against movement. After pressing the control button (START button) located on the counter box, the electronic counter is reset and the pump electromotor located at the filling tank is started. The delivery can be stopped at any moment by releasing the control button. When refueling to a "full" tank, after reaching an 80% fill, the filling spout is closed and the safety regulation (electronic counter) terminates the delivery independently of the control button within 10 seconds. The data of the delivery stay registered on the dispenser counter. Dispensers fitted with electronic pre-selection allow for pre-selecting the desired amount, specified by volume or financial amount. These dispensers are fitted with a two-stage electromagnetic valve.

NOTICE *According to the norm EN 14678-1:2013, Article 4.5.8, LPG dispensers made for self-service must be fitted with a "**dead man's switch**" (START button) which ensures that the filling process can only be started and maintained while the button is pressed.* ***If this button is released, the flow of LPG must be terminated immediately.***

NOTE *According to the norm EN 14678-1:2013, Article 4.5.1.1, LPG dispensers must be fitted with a tear-away or break-away coupling located between the dispensing nozzle and the dispenser, which will interrupt the flow at both ends in case of emergency. OCEAL LPG dispensers are equipped with a breakaway coupling as a standard. This coupling will break under a pressure between 200N and 500N.*

DUTIES OF THE LPG DISPENSER OPERATOR

- ⚠ ***Adhere to all bylaws and operation manuals of gas appliances.***
- ⚠ ***Maintain the operated device in a safe and working state.***
- ⚠ ***Notify any fault, defect, or unusual phenomenon revealed during operation to the filling station owner immediately.***
- ⚠ ***Put the device out of operation in case of gas leak or another danger.***
- ⚠ ***Keep the device in order and clean and prevent unauthorized persons from accessing the appliance.***
- ⚠ ***Notify any events that make the operator's work problematic/difficult to the owner.***
- ⚠ ***Record the data concerning start and end of every shift, inspections, repairs and reviews duly into an operating log book.***
- ⚠ ***The operator of the fuel dispenser and fuel tank may neither carry out any repairs by himself/herself nor change the setting of the equipment or safety fittings.***
- ⚠ ***Regularly control the state of dispensing hoses and their proper hanging in the dispenser, protect them from harm; mainly if the dispenser does not have a retractor and the hose is laid freely on the ground.***

Delivery of LPG into motor vehicles without operator (unattended)

In case of unattended delivery, the customer releases the dispensing nozzle from the dispenser and connects it to the tank of the vehicle. After pressing the control button (START button) located on the counter box, the electronic counter is reset and the pump electromotor located at the filling tank is started. The delivery can be stopped at any moment by releasing the control button or by pressing the STOP button (safety STOP button). When refueling to a "full" tank, after reaching an 80% fill, the filling spout is closed and the safety regulation (electronic counter) terminates the delivery independently of the control button within 10 seconds. After finishing the delivery, the customer must hang the nozzle back in the dispenser – in the nozzle holder. Only after correctly returning the nozzle will the transaction be completed and the delivery registered by the control system.

NOTE->LPG *In the unattended mode, delivery is only commenced after taking the nozzle out of the holder and pressing the START button. Delivery is only finished after releasing the START button and returning the nozzle into the holder. In the attended mode, delivery is commenced/finished just by pressing/releasing the START button.*

NOTE->LPG ***LPG dispensers intended for unattended stations*** *must include, in addition to the START button, a safety STOP button and a nozzle position sensor – see norm EN 14678-1, Article 4.5.6:* ***"Unattended fuel stations must be fitted with a device that ensures correct returning of the filling terminal after fuel delivery".***

5.3.3. SAFETY OF LPG MODULE OPERATION

The owner of the filling station is responsible for its operation; he/she entrusts its operation only to trained staff with relevant authorization. The operators refuel LPG vehicle tanks professionally, check the state of the fuel dispenser and other technology in set intervals, checks the operation of the whole unit and maintains operating records. The no smoking and no open fire within 10 m signs must be installed in a visible place in the vicinity of the fuel dispenser. A motor switch-off sign, max. volume of refueling (80%) sign and preventing the vehicle from undesirable motion sign also must be placed here.

From a design point of view, fuel dispensers and all components that might initiate an explosion are approved by the state authorized institution – the State Testing Laboratory No. 210 FTZÚ Ostrava-Radvanice, which issues the relevant certificates. Environmental safety is certified by the ČIŽP Certificate No. 90/00/895/01/TOM. For detection of potential gas leaks, sensors can be installed in the fuel dispenser area, which are however outside the scope of the basic offer. From a hygienic point of view, the device is harmless for the operator and the owner. When operating the device and carrying out maintenance, it is advisable to protect the hands with gloves.

5.3.4. ELECTROMECHANICAL LITER TOTALIZERS

Upon request, OCEAN dispensers can be equipped with electromechanical totalizers to monitor the total consumed fuel in each dispensing hose. The meters are on the display of the fuel dispenser. For each dispensing hose or nozzle there is one seven-digit electromechanical totalizer that states the quantity of whole liters pumped through the given hose. For multi-product dispensers the electromechanical totalizers are listed on the display from top down or from left to right and are numbered with the hose numbers. Variants of the layout of the electromechanical meters on the fuel dispenser display masks are shown in Figure 36.

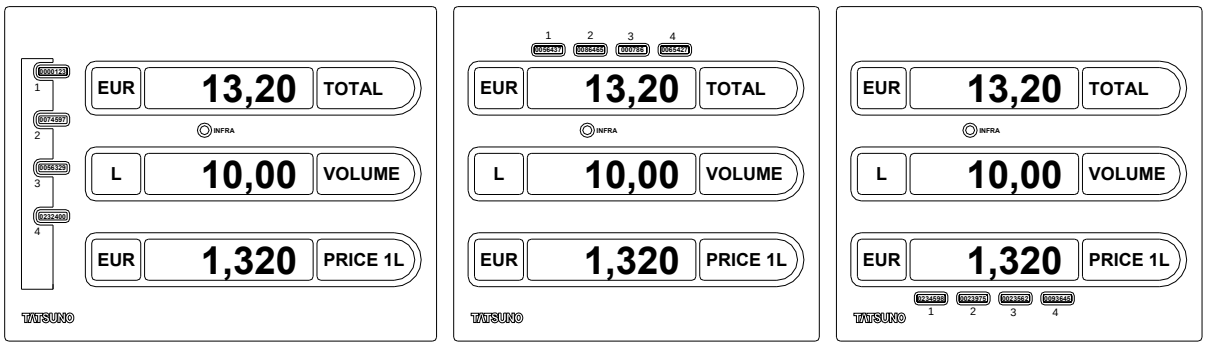


Figure 36 – Variants showing the location of the electromechanical totalizers and IR receivers on the display

NOTE *On display A the electromechanical meters are marked with numbers 1, 2, 3, 4 corresponding to hoses 1A, 2A, 3A and 4A. On display B the electromechanical meters are also marked with numbers 1, 2, 3, 4 corresponding to hoses 1B, 2B, 3B and 4B. The system of marking the hoses and fuel products is described in Figure 36.*

5.3.5. GASOLINE VAPOR RECOVERY

Upon the customer's request, combined OCEAN dispensers can be equipped with a vapor recovery system, where a vacuum pump sucks the vapors of fuels except diesel oil and bio diesel out of the dispensing nozzle's outlet back to the fuel tank.

In case of vapor recovery in a single-product dispenser, the vacuum pump is powered directly by the electromotor of the dispenser's pump. In case of multi-product dispensers, each side of the dispenser has its own vacuum pump powered by an electromotor.

The quantity of recovered vapors is regulated according to the fuel flow rate. This means that if fuel is not being pumped into the tank, the vapor recovery function is off.

The correct function of the vapor recovery system is monitored by a vapor flow meter VRS1.M, which is installed at the outlet of each exhaust vacuum pump. The flow of vapors through the system is signaled either by a green diode lit on the display panel or by lit display segments on the first symbol of the unit price display.

As long as the vapor recovery mechanism is set properly, the signaling of the exhaust activity is activated whenever fuel is being dispensed and when the vapors go through the exhaust pipes, i.e. the vapor flow sensor VRS1.M is active. A part of the hydraulic module of the OCEAN dispenser with the electromotor, two exhaust vacuum pumps and VRS1.M sensors is shown in Figure 37.

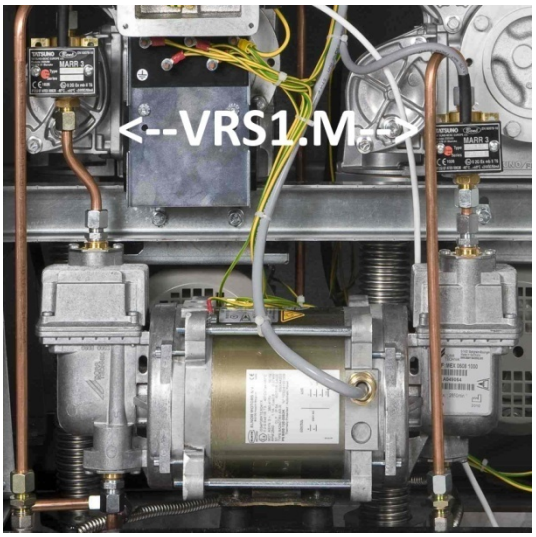


Figure 37 – Vapor recovery with vapor flow sensor VRS1.M

Fuel station operation conditions (Directive 355/2002 Coll. - Attachment 12)

„ All fuel dispensers must have a clear label informing the customers about the need to fully insert the dispensing nozzle into the filling orifice of the motor vehicle petrol tank."

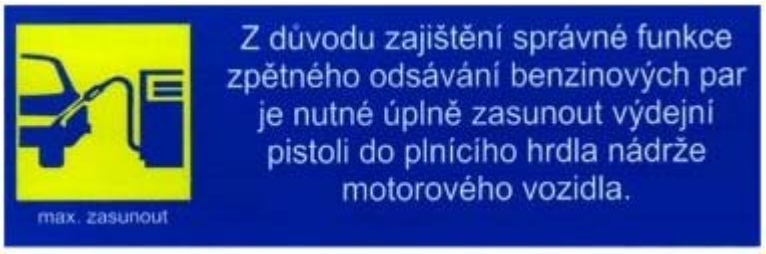


Figure 38 - Example of an info label about vapor recovery according to Directive 355/2002 Coll.

Fuel station operation conditions (Directive 355/2002 Coll. - Attachment 12)

„The functionality of the vapor recovery system in fuel dispensers is checked by the operator of the fuel station in regular intervals, at least once every shift. In dispensers with optical signaling of the vacuum pump functionality, the operator checks the functionality of the signal light during dispensing."

NOTICE *If suspicion arises that the vapor recovery system isn't working or that its signaling is broken, the operator must immediately inform the service organization and an inspection must be carried out and any malfunctions repaired.*

5.3.6. DISPENSER OPERATING MODES

The fuel dispenser has two basic operation modes:

1) manual mode
2) automatic (remote) mode

The **Manual mode** is a mode when the dispenser works independently, separately, without remote control.

Delivery process: The customer comes to the dispenser and takes the dispensing nozzle of the desired product. The display resets (ca 1.5 seconds) and the pump engine switches on – now the dispenser is ready to start dispensing. After refueling the vehicle's tank, the customer puts the nozzle back and pays for the fuel to the operator. The dispenser is ready for the next customer immediately. Because in the manual mode the dispenser is not controlled in any way, the fuel unit price must be set manually at the dispenser (see chapters 4.1.7 and 4.2.1. The quantity of pumped liters per work shift is measured as the difference between the electronic (or electromechanical) totalizers status at the beginning and at the end of the shift.

The **Automatic mode** is a mode when the dispenser is remotely controlled (via PC program, control console, station controller etc.). The Automatic mode allows remote regulation of pumping from the fuel station kiosk. The kiosk contains a control device that is used by the operator to release pumping at a dispenser and after the end of the pumping collects information about the quantity of the consumed fuel and its price.

Delivery process: The customer comes to the dispenser and takes the dispensing nozzle of the desired product. The dispenser asks the control center in the kiosk for a release. The control centre sends to the dispenser the unit price of fuel, the maximum amount/volume for delivery and allows dispensing. The display is reset (*ca 2 seconds after the nozzle is lifted) and the pump engine starts. After filling the vehicle's tank, the customer puts the nozzle back and goes into the kiosk to pay the price and receives a tax document (receipt) for the payment. The dispenser is immediately ready for the next customer. Because in the automated mode the dispenser is remotely controlled, the fuel unit price does not need to be set manually. The proper unit price is automatically set by the controlling computer for all dispensers of the station.

***Note:** Immediately after the pumping is allowed, the dispenser's display resets. The time from lifting the nozzle to the display reset and pump startup can differ significantly depending on the used control system and fuel station configuration; it can range from 2 to 5 seconds.*

Switching from automated mode to manual mode. By default, dispensers are installed and set according to the expected mode used at the individual fuel station, i.e. if the fuel station has a control system, the dispensers are set in the automatic mode; if the fuel station does not have a control system, dispensers are set in the manual mode.

In case it is necessary to switch the dispensers from the automatic mode to the manual mode – e.g. due to a malfunction of the control system – proceed as follows:

- ***Counter PDEX.*** Using the IR controller, change the P12 parameter value from 0 to 3 and set the unit prices in parameter P03, see chapter 4.1.14.
- ***Counter TBELTx.*** Using the 4-key keyboard, change the P00 parameter value from 0 to 1 and set the unit prices, see chapter 4.2.3.

NOTICE *Switching from the automated mode to the manual mode must always be consulted with a service technician in advance!*

5.3.7. PRE-SETTING KEYBOARD

OCEAN dispensers can be equipped with a "pre-set keyboard", which allows the customer to pre-set the desired amount or quantity of fuel right at the dispenser. Before starting the delivery, the customer can set the volume of fuel or amount of money to be dispensed. The pre-set value can be cancelled by pushing the <**Zruš**> (i.e. Cancel) button before the delivery starts. Then it is possible to choose a different pre-set value or dispense fuel normally without a pre-set.

NOTE *If the pre-set keyboard is used, the dispensers must be equipped with slow-down valves that ensure safe slowdown of the fuel flow rate in advance before reaching the pre-set target value.*

a) Example of pre-set in Czech crowns

- The customer comes to the dispenser and wants to spend 250 CZK on fuel.
- On the pre-set keyboard the customer uses the keys to enter the value 250 (by pushing the <**100 CZK**> key twice and the <**10 CZK**> key five times).
- The customer chooses the desired product, takes the nozzle off the dispenser and inserts it into the vehicle's fuel tank.
- The dispenser pumps fuel worth exactly the pre-set amount and then stops automatically.
- The customer puts the nozzle back in the dispenser and goes to pay.

b) Example of pre-set in liters

- The customer comes to the dispenser and wants to get 20 liters of fuel.
- On the pre-set keyboard the customer enters 20 (by pushing the button <**10 liters**> twice).
- The customer chooses the desired product, takes the nozzle off the dispenser and inserts it into the vehicle's fuel tank.
- The dispenser pumps fuel in the pre-set volume and then stops automatically.
- The customer puts the nozzle back in the dispenser and goes to pay.

***c) Example of pumping into a full tank with additional pumping to a rounded amount**

- The customer comes to the dispenser and wants to get a full tank of fuel.
- The customer chooses the desired product, takes the dispensing nozzle and inserts it in the vehicle's fuel tank.
- When the tank is almost full, the customer takes the nozzle out and on the pre-set keyboard pushes the key with the financial amount to whose multiple the customer wants to round (<**10 CZK**>).

***d) Example of pumping into a full tank with additional pumping to a rounded volume**

- The customer comes to the dispenser and wants to get a full tank of fuel.
- The customer chooses the desired product, takes the dispensing nozzle and inserts it in the vehicle's fuel tank.
- When the tank is almost full, the customer takes the nozzle out and on the pre-set keyboard pushes the key with the volume to whose multiple the customer wants to round (e.g. <**1 L**>).
- The customer restarts the nozzle and lets the dispenser pump more fuel to reach the rounded volume (e.g. 25.00 L or 128.00 L).
- The customer puts the nozzle back to the dispenser and goes to pay.

***Note:** Examples c) and d) are only possible in OCEAN dispensers with the electronic counter PDEX and an activated pre-set keyboard function during fuel pumping.*

5.3.8. TURNING FUEL DISPENSERS OFF

RECOMMENDATION ***When turning a dispenser off, the producer recommends proceeding as follows:***

- ***Turn off the 3x400V circuit breakers of the pump and vacuum pump motor power supply.***
- ***Turn off the 230V circuit breakers of the stabilized power supply to the dispenser's electronic counter.***

- ***Turn off the UPS backup power source located in the kiosk using the switch on its rear panel (the green light on the UPS will go out).***

6. MAINTENANCE AND SERVICE

6.1. KEY PRINCIPLES FOR THE MAINTENANCE OF DISPENSERS

- Keep all functional units of the dispenser clean so that any malfunction can easily be seen and repaired.
- Check regularly all connections to monitor any leakage. Tighten the connections or change the sealing if necessary.
- Check the proper strain on the V-belt and adjust it if necessary using the engine's tilting console.
- Check the screws connecting the electromotor to the console. Tighten if necessary.
- Regularly check the dispensing nozzle condition. In case of a defect, decide on a repair or replacement according to its severity and type.
- Regularly check the condition of dispensing hoses. In case of mechanical damage of the dispensing hose coating, ensure its immediate replacement.
- Check the function of locks and mechanisms for hanging the dispensing nozzle.
- Maintain outer cleanliness of the dispenser, take special care to clean the glass of the counter.
- Regularly use a sludge pump to remove sludge, water and other impurities from the fuel station's fuel storage tanks.

CAUTION ***Before performing any maintenance on the mechanical, hydraulic or electrical elements, the power supply must always be turned off and it is necessary to ensure that the power does not get restarted!***

CAUTION ***Do not remove the covers of the dispenser while it is in operation!***

Figure 39 – Dispenser without cover, side B

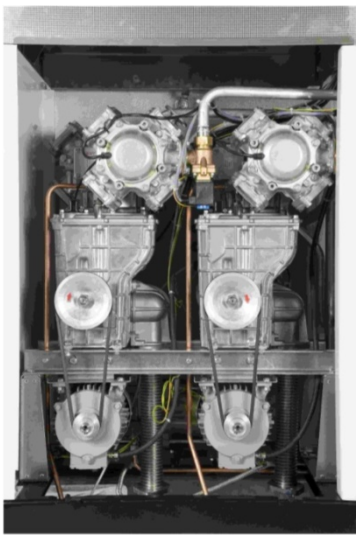


Figure 40 – Dispenser without cover, side A

CAUTION ***The belt between the engine and the pump (or vacuum pump) is antistatic and may not be replaced with a different type!***

CAUTION ***Do not open the distribution box cover if the dispenser is under power!***

CAUTION->LPG

- ⚠ ***Every manipulation and deconstruction, even opening the filter cap, is conditioned by displacing the entire medium by nitrogen or an inert gas from the hydraulic system of the dispenser!***
- ⚠ ***Interventions into the electric and electronic parts may only be carried out by a specialist who is responsible for the device safety. After finishing the service intervention, all conduits must be re secured into their original positions. Correct conduit placement prevents their contact with moving parts of the retractor module.***
- ⚠ ***Attention! During every service intervention, it is necessary to visually check the tightness of all hydraulic parts and remove possible mixing of media.***

THE DISPENSER OPERATOR MUST:

- Appoint an operator responsible for the operation and technical state of the dispenser.
- Ensure controls, tests, repairs and maintenance in a professional fashion.
- Keep all documents and maintain an operation journal.
- All activities related to attending, operating and servicing of the LPG dispenser may only be carried out by personnel with the appropriate authorization.

PRINCIPLES FOR CHECKING THE LPG MODULE

Checks of the equipment, tanks, piping and dispenser are carried out in intervals set by the operation rules of the fuel station, in accordance with valid regulations.

- Test the tightness of the dispenser's hydraulic system with a soap solution.
- Test the machinery.
- Test the function of the check and safety valves.
- The control, calibration and official verification of an LPG dispenser is carried out by the Czech Inspectorate for Metrology (ČMI) according to valid regulations; in foreign countries they are secured by local authorities. The dates for calibration of the measuring device are set by the Law No. 505/1990 Coll.
- All controls are preceded by cleaning of the whole device from dust, removing water and other impurities from the tanks.

6.1.1. MAINTENANCE OF DISPENSER COVERS

The covers of the dispenser (the "bodywork") made of laminate, varnished steel or stainless steel requires regular maintenance. Special attention must be paid to them during the winter season, when chloride aerosols from road sprinkling salts can permanently damage the bodywork varnish if it is not treated properly.

Covers made of stainless steel can undergo inter-crystalline corrosion. Regular maintenance of bodywork elements is done with water or a solution of detergent and with normally available automotive cosmetics.

6.2. DISPENSER TROUBLESHOOTING

In case of any problems with the fuel dispenser, first study **What to do when …** (see Table 28), which contains frequently asked questions of dispenser users concerning problems occurring at fuel stations.

In case of dispenser malfunction, the electronic counter controlling the dispenser will show an error message in the form of a numerical code. The error codes for the individual counter types are listed in Chapter 6.2.1.

Table 28 – What to do when …

The dispenser is unresponsive to lifting a nozzle from its holder and the display fails to show an error message.
This can mean that the dispenser is without electric power, the dispensing nozzles are improperly hung or the dispenser is blocked by the control system. ➢ Check proper hanging of all nozzles. ➢ Check if the fuel delivery at the dispenser has been paid at the cash desk. ➢ If the dispenser is in Manual mode, try unblocking it with the remote IR controller (press the <**0**> key). ➢ Turn the dispenser counter power off and on. ➢ Check the power supply to the dispenser – after switching the power on, the display must undergo a test sequence. ➢ Check the position of the single phase 230 V power circuit breaker of the dispenser at the main distributor of the station. ➢ If the dispenser is connected to a controlling computer, the blocking of the dispenser may be caused by the control system, which fails to release the dispenser to allow delivery or blocks the dispenser. Turn the power of the dispenser off and on and change its mode from Automatic to Manual mode – see Chapter 4.1.14 or 4.2.3. If the dispenser operates in the Manual mode, the problem is likely to be in the controlling computer.
After lifting the dispensing nozzle, the display is reset but the pump fails to start up.
This means the electromotor of the dispenser has not started. This can be due to a circuit breaker in the electromotor's power supply, which is located on the main distributor, being turned off. Alternately, the protection of the electromotor inside the dispenser may be disconnected. ➢ In the main distribution box of the station, check the position of the circuit breaker of the three phase power supply to the dispenser motor.
The dispenser's display shows the error code "**E18**"
This is an error message of the dispenser that informs about loss of communication between the dispenser and the control unit (computer, station controller, control console etc.). ➢ Check the proper function of the control unit (turn on the computer, turn on the data converter etc.). ➢ Check the connection of the data cable.
At the beginning of delivery, the dispensing nozzle is lifted but doesn't start pumping immediately (e.g. due to opening the vehicle's fuel tank). After a moment the dispenser's pump turns off. The display shows the message "**STOP**".
This message means that fuel drawing was terminated due to an interruption longer than 60 seconds. Hang the nozzle back and start a new delivery.
Delivery is interrupted for some time (e.g. to change canisters); after a moment the pump turns off. The displays show the message "**STOP**".
This message means that fuel drawing was terminated due to an interruption longer than 60 seconds. Hang the nozzle back and start a new delivery.
After lifting the dispensing nozzle, the dispenser's display shows the error message "**E30**".
This error code means that the unit price of the fuel is zero. ➢ If the dispenser is operating in the Manual mode with no remote control, then the unit price is set incorrectly. Set the fuel's unit price – see Chapters 4.1.7 and 4.2.1.

- If the dispenser operates in a remote controlled mode, check the setting of individual fuel unit prices in the control unit of the station (computer, controller). Before every delivery, the fuel unit price is automatically transmitted to the dispenser.

6.2.1. DISPENSER ERROR MESSAGES

After each error in a dispenser with a PDEX or TBELTX counter, fuel delivery is suspended and the display shows an error ("E" + error code). Based on the message type, either the whole dispenser gets blocked (fatal error) or only one part where the error occurred is blocked.

Important error messages are recorded in the counter's memory, where they can be recalled using the P06 (Error history) and P13 (Error statistics) parameters.

Table 29 – Types of error messages of PDEX and TBELTX counters

Message type	Method of dispenser blocking	Method of dispenser unblocking
LOCK (operational blocking)	Blocks a part of the dispenser.	The message disappears from the display after hanging the dispensing nozzle back
ALERT (warning)	Blocks only the part of the dispenser where the error occurred. The message code is recorded in the history and statistics.	The message disappears from the display as soon as the cause of the error is repaired.
NFAT (non-fatal error)	Blocks only the part of the dispenser where the error occurred. The message code is recorded in the history and statistics.	The message disappears from the display after hanging the dispensing nozzle back. It is possible to unblock the dispenser and cancel the error by means of a remote controller, or via the data line.
FATAL (fatal error)	Blocks the whole dispenser and the message code is recorded in the history and statistics.	The cause of the error must be repaired. The power supply to the dispenser's counter must be turned off and on.

Table 30 – Error message codes in dispensers with PDEX or TBELTX counter

Message code	Message type	Cause of the error message	Error message removal method
OFF	FATAL	Supply power outage. Supply power outage longer than approx. 3-5 periods, t > 100ms.	The power supply to the dispenser's counter must be turned off for approx. 10 seconds and turned back on.
STOP	LOCK	Maximum time for pumping suspension exceeded.	The message disappears after hanging the dispensing nozzle back in its holder.
E 1	NFAT	Display error – malfunctioning LCD display segment or an error of an electromechanical display reel.	Turn the power supply to the dispenser off and on. If the error persists, contact authorized service.
E 2	FATAL	Display error – the real quantity of displays is different from the quantity set in the P31 parameter.	Turn the power supply to the dispenser off and on. If the error persists, contact authorized service.
E 3	NFAT	Vapor recovery system error. Vapor flow sensor error on side A.	Turn the power supply to the dispenser off and on. If the error persists, contact authorized service.
E 4	NFAT	Vapor recovery system error. Vapor flow sensor error on side B.	Turn the power supply to the dispenser off and on. If the error persists, contact authorized service.
E 5	ALERT	Display error – error in communication with the display or with an electromechanical totalizer.	Turn the power supply to the dispenser off and on. If the error persists, contact authorized service.

Message code	Message type	Cause of the error message	Error message removal method
E 6	NFAT	Error of an electromechanical totalizer.	Turn the power supply to the dispenser off and on. If the error persists, contact authorized service.
E10	NFAT	Error of the thermal sensor.	Turn the power supply to the dispenser off and on. If the error persists, contact authorized service.
E11	NFAT	Invalid value of fuel density.	Turn the power supply to the dispenser off and on. If the error persists, contact authorized service.
E12	FATAL	Error of the thermal compensation device. The PDEINP unit is disconnected or its check sum is wrong.	Turn the power supply to the dispenser off and on. If the error persists, contact authorized service.
E13	FATAL	Program error – error of the metrology or program checksum.	Turn the power supply to the dispenser off and on. If the error persists, contact authorized service.
E16	ALERT	Credit unit error. Error in the communication between the counter and the PDECRE credit unit.	Turn the power supply to the dispenser off and on. If the error persists, contact authorized service.
E17	NFAT	Data line error. Error in the serial communication line, wrong communication data. The control computer fails to send <ACK> confirmation in time.	Check that no two dispensers have the same address. Check the mechanical connection of the data line. Check the function and setting of the data converter. Use the monitor to check the communication progress.
E18	ALERT	Data line error. Error in the serial communication line, loss of communication.	Controlling computer not connected or the communication cable is not connected properly. Check the setting of parameter P76. Check the data converter function. Use the monitor to check the communication progress.
E20	NFAT	Loss of power supply during delivery. The latest fuel drawing was terminated unexpectedly due to a power outage or due to a processor reset caused by interference.	Check the power supply of the dispenser and possible interference (in power supply).
E22	FATAL	Data initialization. Faulty data in the RAM and EEPROM memory – invalid check sum.	Call the authorized service
E25	FATAL	Error of electronic totalizers. Electronic totalizers are wrong. The checksum is wrong.	Call the authorized service
E26	ALERT	The TOTAL STOP key is pressed.	The message disappears once the button is unblocked.
E27	FATAL	The manufacturer has blocked the fuel dispenser.	In parameter 16 enter the authorization code. Turn the power supply to the dispenser off and on. If the error persists, call the authorized service.
E29	NFAT	Wrong password. A wrong password was used to enter the manager mode.	Enter the correct manager password. If the error persists, call the authorized service.
E30	LOCK	The fuel unit price is zero.	Set the fuel unit price at the cash desk (P12=0), or in parameter P3 (P12=3).
E31	NFAT	Pulser error – error in channel of pulser #1 (1A).	Lift and replace the nozzle several times. Turn the dispenser power off and on. If the error persists, call the authorized service.
E32	NFAT	Pulser error – error in channel of pulser # 2 (2A).	
E33	NFAT	Pulser error – error in channel of pulser # 3 (3A).	

Message code	Message type	Cause of the error message	Error message removal method
E34	NFAT	Pulser error – error in channel of pulser # 4 (4A).	
E35	NFAT	Pulser error – error in channel of pulser # 5 (1B / 5A).	
E36	NFAT	Pulser error – error in channel of pulser # 6 (2B / 6A).	
E37	NFAT	Pulser error – error in channel of pulser # 7 (3B / 7A).	
E38	NFAT	Pulser error – error in channel of pulser # 8 (4B).	
E41	NFAT	Pulser error – error in connection of pulser # 1 (1A).	Lift and replace the nozzle several times. Turn the dispenser power off and on. If the error persists, call the authorized service.
E42	NFAT	Pulser error – error in connection of pulser #2 (2A).	
E43	NFAT	Pulser error – error in connection of pulser #3 (3A).	
E44	NFAT	Pulser error – error in connection of pulser #4 (4A).	
E45	NFAT	Pulser error – error in connection of pulser #5 (1B / 5A).	
E46	NFAT	Pulser error – error in connection of pulser #6 (2B / 6A).	
E47	NFAT	Pulser error – error in connection of pulser #7 (3B / 7A).	
E48	NFAT	Pulser error – error in connection of pulser #8 (4B).	
E51	NFAT	Pump filled with air. The aeration sensor of the pump is active.	Check the fuel level in the storage tank and check for any leakage of the supply fuel pipe. If the error persists, call the authorized service.
E52	NFAT	Pump filled with air. The maximum quantity of tests of separation exceeded.	Check the fuel level in the storage tank and check for any leakage of the supply fuel pipe. If the error persists, call the authorized service.
E54	ALERT	The effectiveness of the vapor recovery system is beyond the allowed scope. If the fault is not corrected within 72 hours, the dispenser is blocked (see the error message E55).	Correct the fault of the vapor recovery system. Call the authorized service.
E55	NFAT	Vapor recovery system error.	Correct the fault of the vapor recovery system. Unblock the VAPORIX system using a service adaptor. Call the authorized service.

6.3. SERVICE OF OCEAN DISPENSERS

- Service is carried out in accordance with the fuel station's rules of operation.
- Before commencing service, the dispenser must be put out of operation, fitted with a clearly visible "OUT OF ORDER" sign, and the access road must be marked with a "NO ENTRY" sign.
- The serviced dispenser must be disconnected from the power source (turn off the main switch).
- The valves on the supply pipe must be fully closed.
- During service, passage of vehicles in the area of 5 m around the dispenser must be prevented.
- A fire extinguisher must be available at all times.
- Service may only be carried out by authorized personnel of the service company.

The service of TATSUNO EUROPE a. s. dispensers is ensured by:

SPEED CZECH SERVICE, s.r.o.
Pražská 2325/68
678 01 Blansko, Czech Republic
info@speedcz.com, www.speedcz.com

HOT-LINE: +420 602 562 277

6.3.1. WARRANTY AND CLAIMS

The contractual warranty is provided for the supplied equipment for a period of 2 years or 1 million liters of delivered fuel. This warranty does not cover consumables. When filing a claim, the following information has to be provided:

- Serial number and name – see the type label
- Exact description of the fault and the circumstances under which it formed

A claim is invalid if the sealing is broken or there was any unauthorized manipulation with the device. Defects and deficiencies which arise as a result of incorrect or unauthorized using or maintenance are outside the scope of the warranty (i.e. problems that arise because of the presence of water and impurities in the tank and hydraulic system). During operation, it is necessary to regularly check for the presence of water and impurities, and clean the systems if necessary.

6.3.2. ATTACHMENTS

- Installation and User Manual
- Certificate of the Quality and Completeness of the Product
- ES Declaration of Conformity
- Base Certificate
- Base Certificates of all meters installed in the dispenser
- Protocol of Pressure test (only to dispensers with LPG module)
- IR controller for operation and setup of the calculator
  (upon request for dispensers equipped with the PDEX counter)
- Base frame (upon request)
- IR controller for operation and for counter setup

Spare parts catalogue

This document is issued and distributed only to service companies and service technicians.

NOTES:

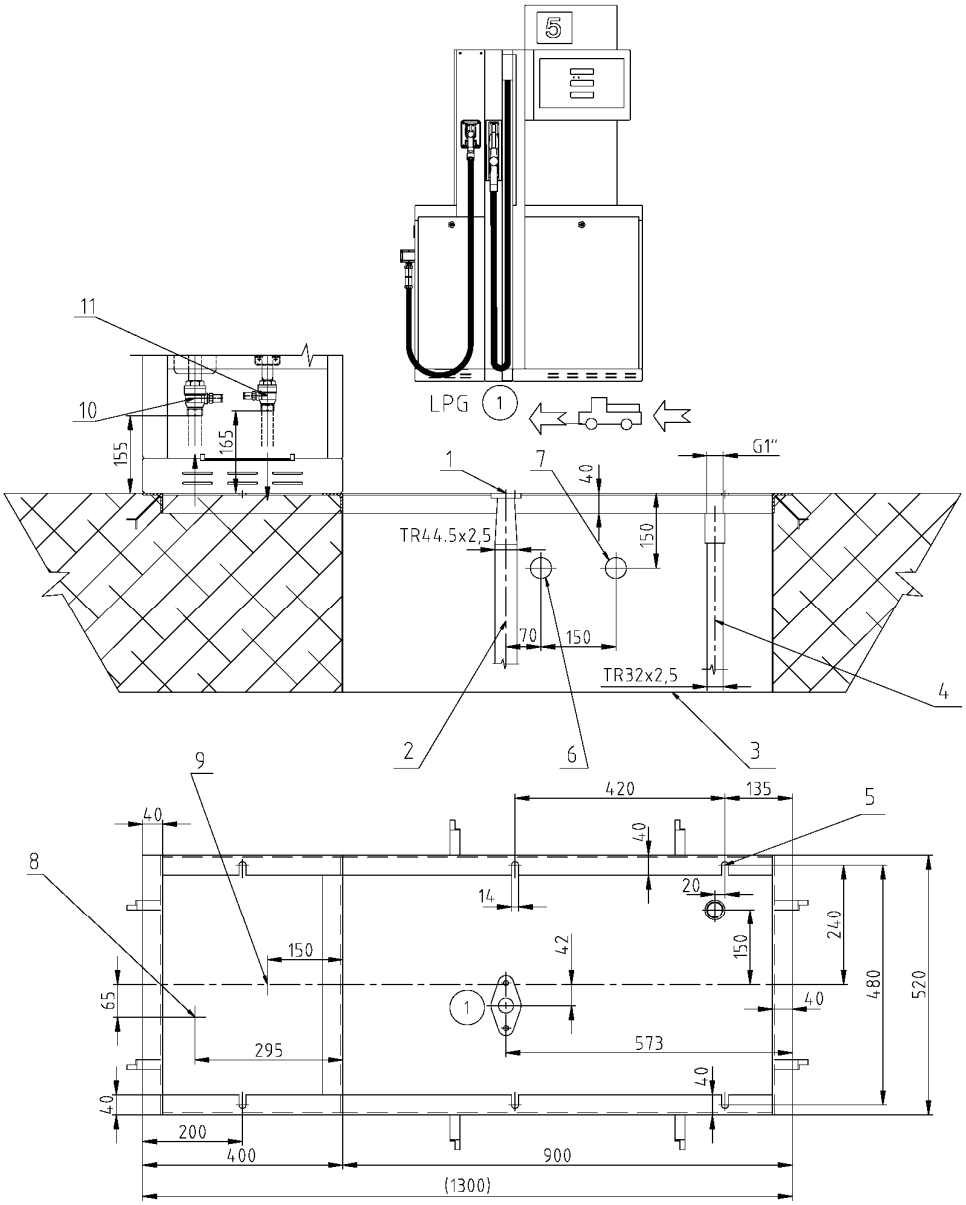
NOTES:

APPENDIX 1 – FOUNDATION PLANS

APPENDIX 1.1. – FOUNDATION PLANS FOR DISPENSERS IN SUCTION MODEL

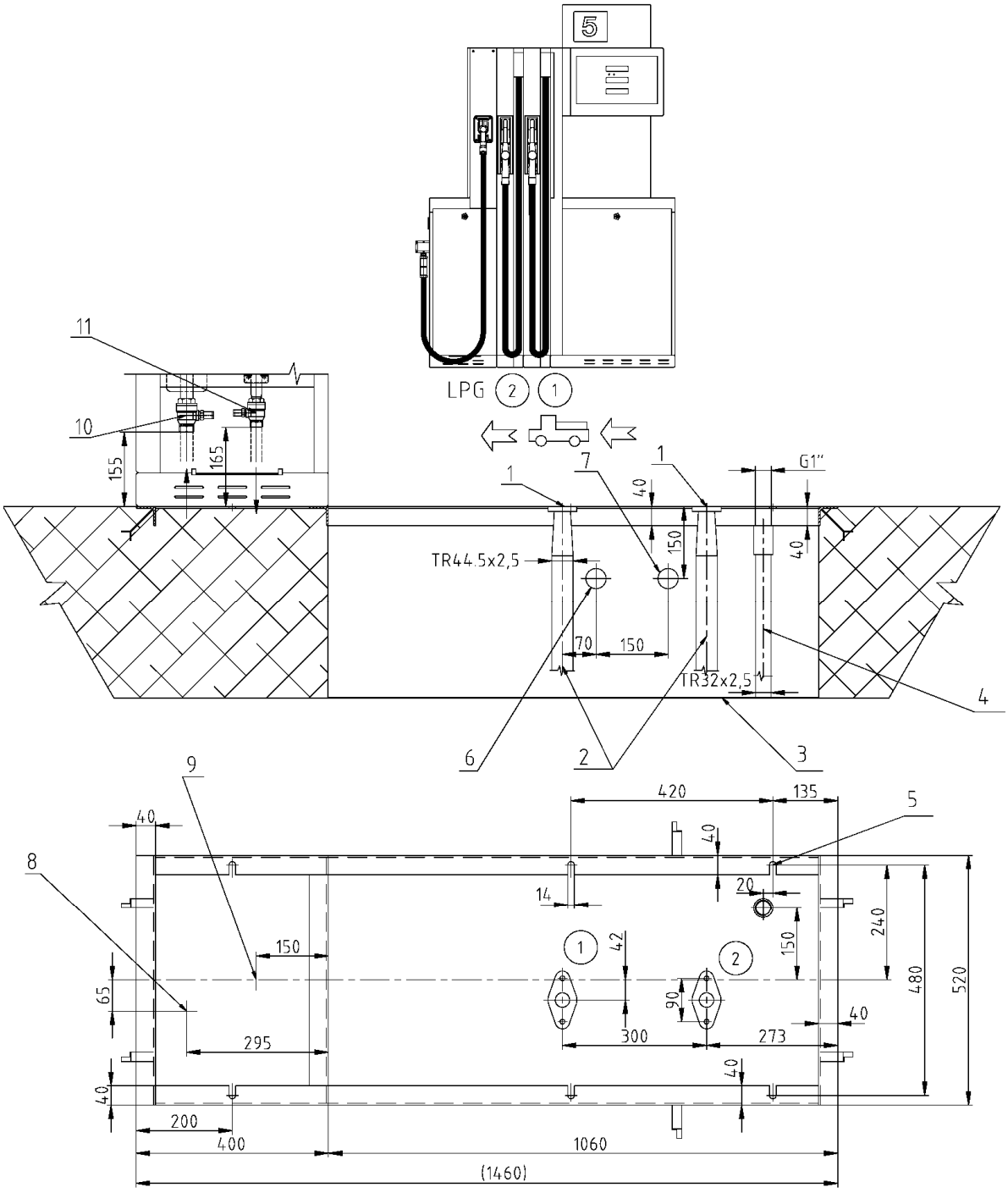
APPENDIX 1.1.1. FOUNDATION PLANS OF COMBINED DISPENSERS WITH LPG MODULE

1.1.1.a. Plans of BMP4011.OEL(R)+MOD4011.OEL(R)/LPG & BMP4012.OED+MOD4012.OED/LPG dispensers



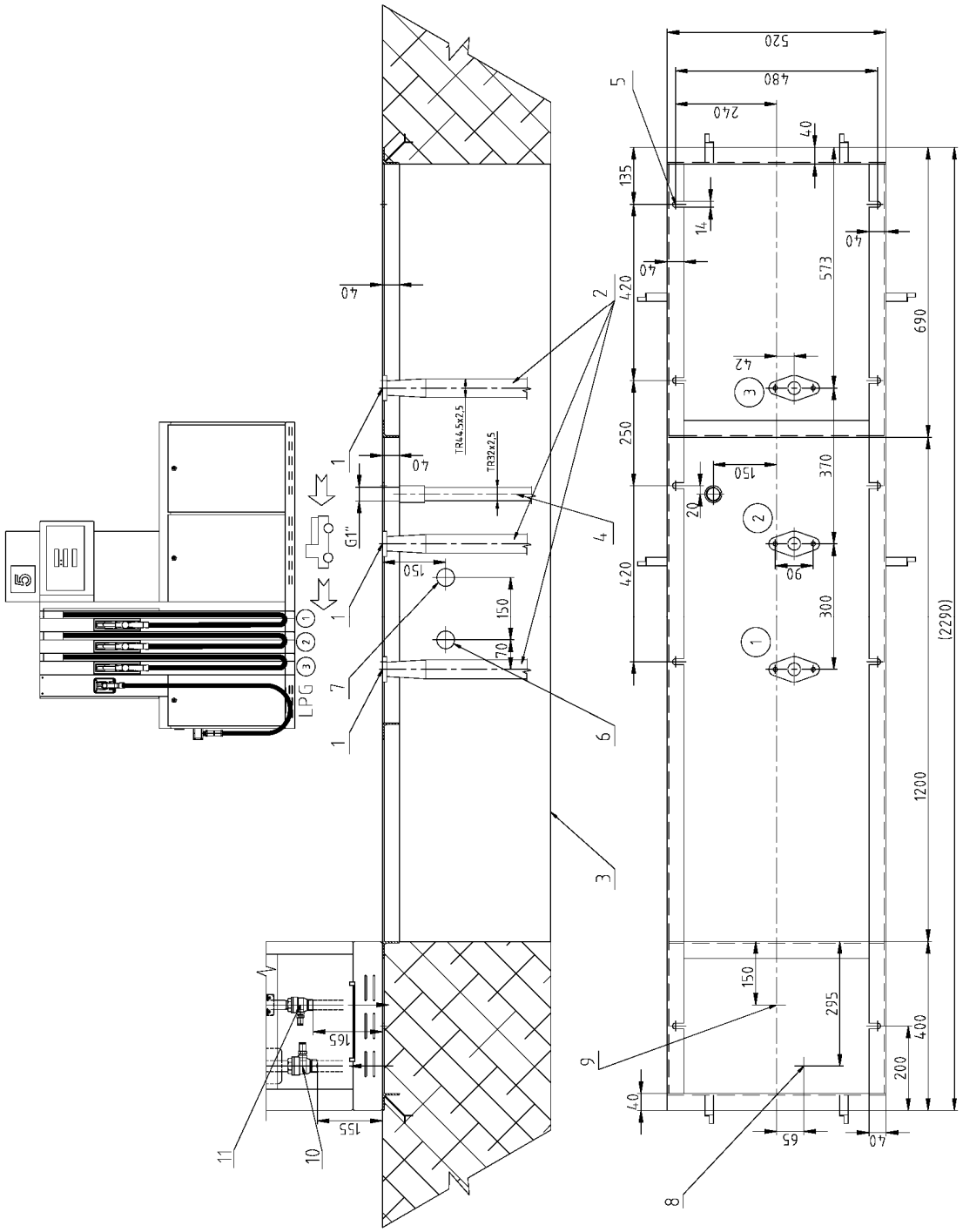
Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	7	Output of electrical cables for data transmission
2	Suction piping - TR 44.5 x 2.5	8	Axis of Inlet piping for liquid phase LPG
3	Leak catcher tray	9	Axis of Return piping for gaseous phase LPG
4	Vapor recovery piping TR 32 x 2.5 is terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	10	Inlet ball valve for LPG liquid phase G 3/4" (internal thread)
5	Anchoring holes	11	Outlet ball valve for LPG gaseous phase G 1/2" (internal thread)
6	Outlet of electrical cables for dispenser powering	⇦	Recommended direction of arrival of the vehicles to the dispenser

1.1.1.b. BMP4022.OEL(R)+MOD4011.OEL(R)/LPG & BMP4024.OED+MOD4012.OED/LPG



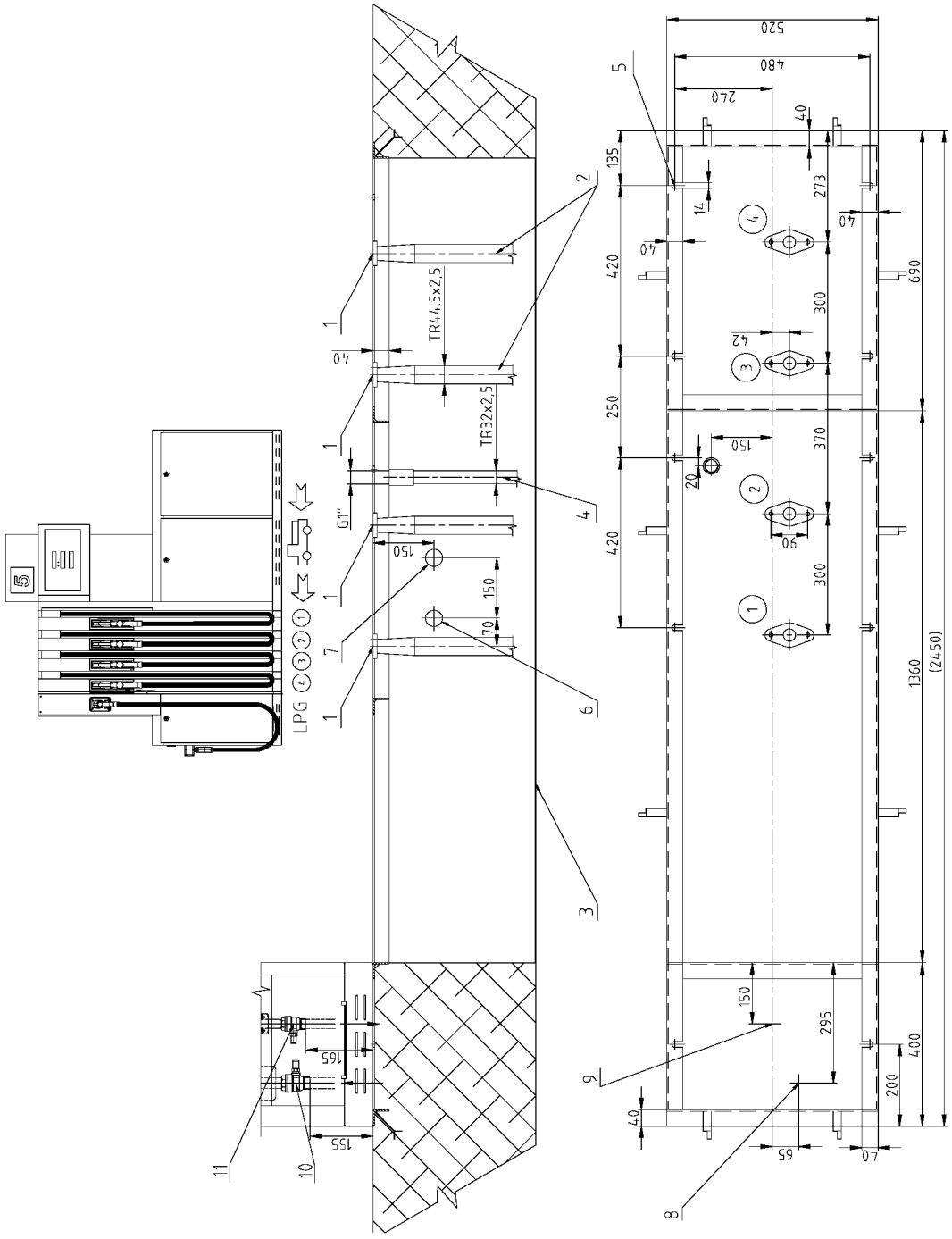
Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	8	Axis of LPG inlet piping LPG for liquid phase
2	Suction piping - TR 44.5 x 2.5	9	Axis of Return piping for gaseous phase LPG
3	Leak catcher tray	10	Inlet ball valve for LPG liquid phase G 3/4" (internal thread)
4	Vapor recovery piping TR 32 x 2.5 is terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	11	Outlet ball valve for LPG gaseous phase G 1/2" (internal thread)
5	Anchoring holes	⇦	Recommended direction of arrival of the vehicles to the dispenser
6	Outlet of electrical cables for dispenser powering	①②	Order of fuel products
7	Outlet of electrical cables for data transmission		

1.1.1.c. BMP4033.OEL(R)+MOD4011.OEL(R)/LPG & BMP4036.OED+MOD4012.OED/LPG



Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	8	Axis of LPG inlet piping LPG for liquid phase
2	Suction piping - TR 44.5 x 2.5	9	Axis of Return piping for gaseous phase LPG
3	Leak catcher tray	10	Inlet ball valve for LPG liquid phase G 3/4" (internal thread)
4	Vapor recovery piping TR 32 x 2.5 is terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	11	Outlet ball valve for LPG gaseous phase G 1/2" (internal thread)
5	Anchoring holes	⇦	Recommended direction of arrival of the vehicles to the dispenser
6	Outlet of electrical cables for dispenser powering	①② ③	Order of fuel products
7	Outlet of electrical cables for data transmission		

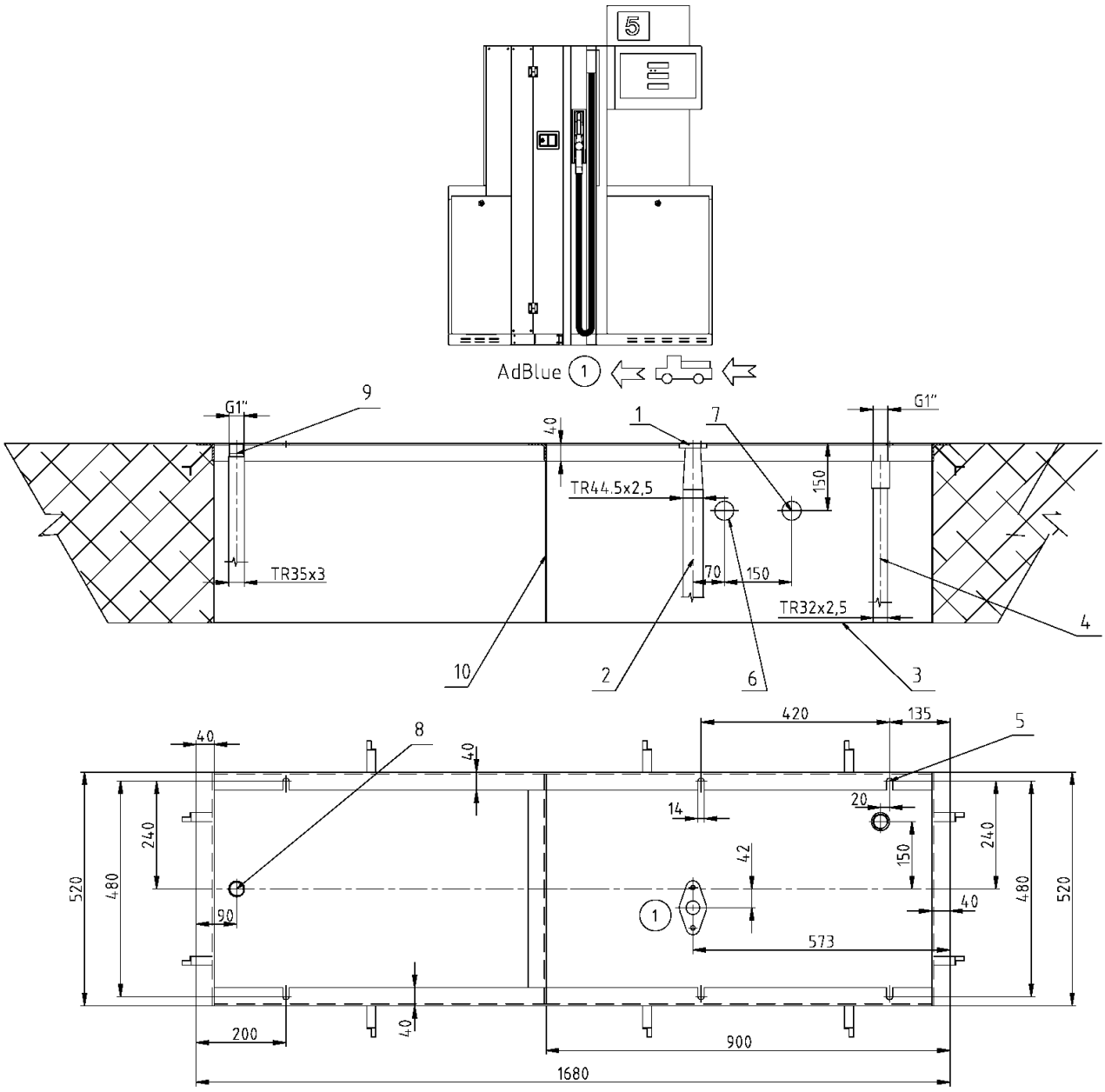
1.1.1.d. BMP4044.OEL(R)+MOD4011.OEL(R)/LPG & BMP4048.OED+MOD4012.OED/LPG



Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	8	Axis of LPG inlet piping LPG for liquid phase
2	Suction piping - TR 44.5 x 2.5	9	Axis of Return piping for gaseous phase LPG
3	Leak catcher tray	10	Inlet ball valve for LPG liquid phase G 3/4" (internal thread)
4	Vapor recovery piping TR 32 x 2.5 is terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	11	Outlet ball valve for LPG gaseous phase G 1/2" (internal thread)
5	Anchoring holes	⇦	Recommended direction of arrival of the vehicles to the dispenser
6	Outlet of electrical cables for dispenser powering	①② ③④	Order of fuel products
7	Outlet of electrical cables for data transmission		

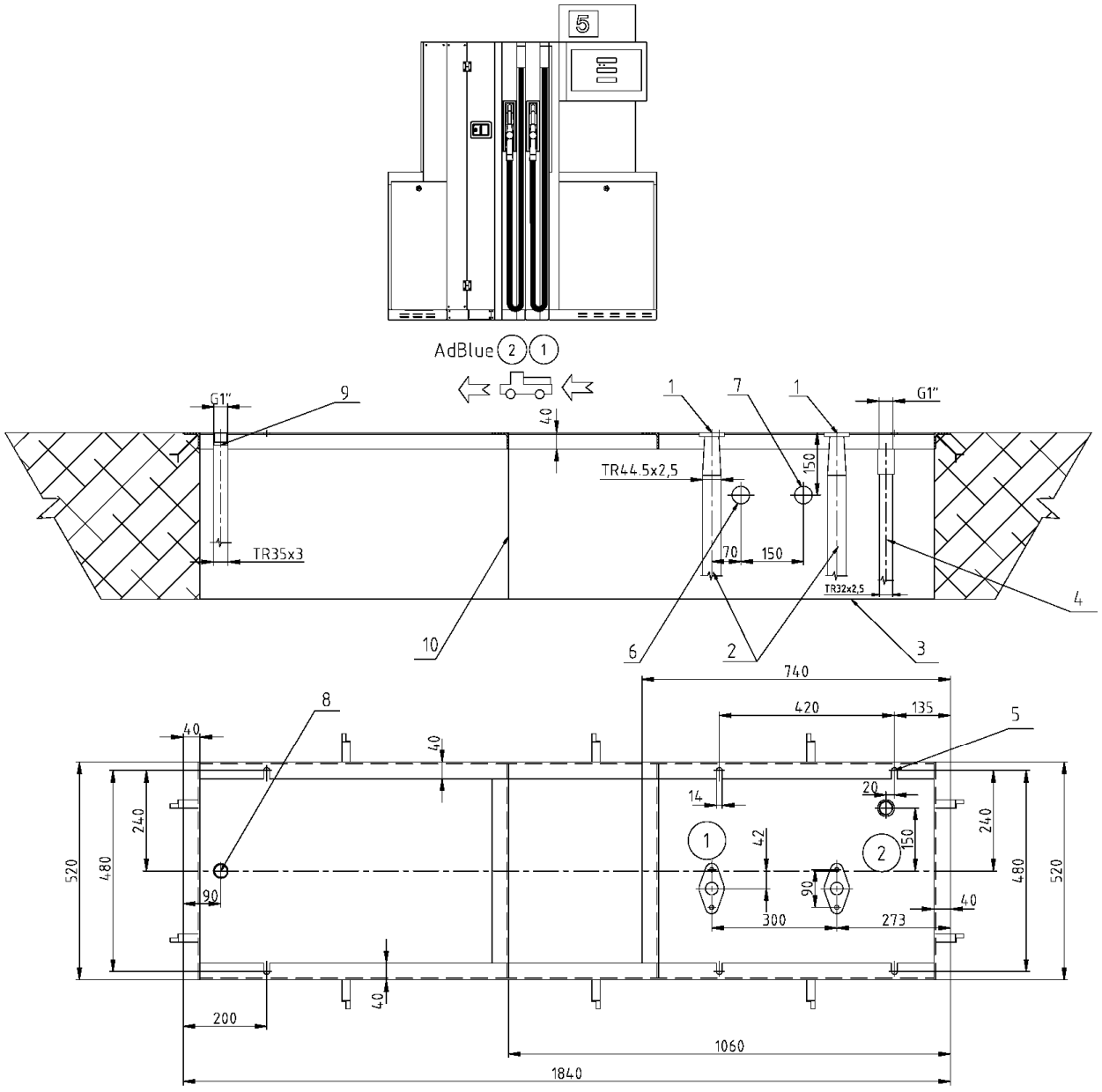
APPENDIX 1.1.2. FOUNDATION PLANS FOR COMBINED DISPENSERS WITH ADBLUE® MODULE

1.1.2.a. BMP4011.OEL(R)+MOD4011.OEL(R)/AdB & BMP4012.OED+MOD4012.OED/AdB



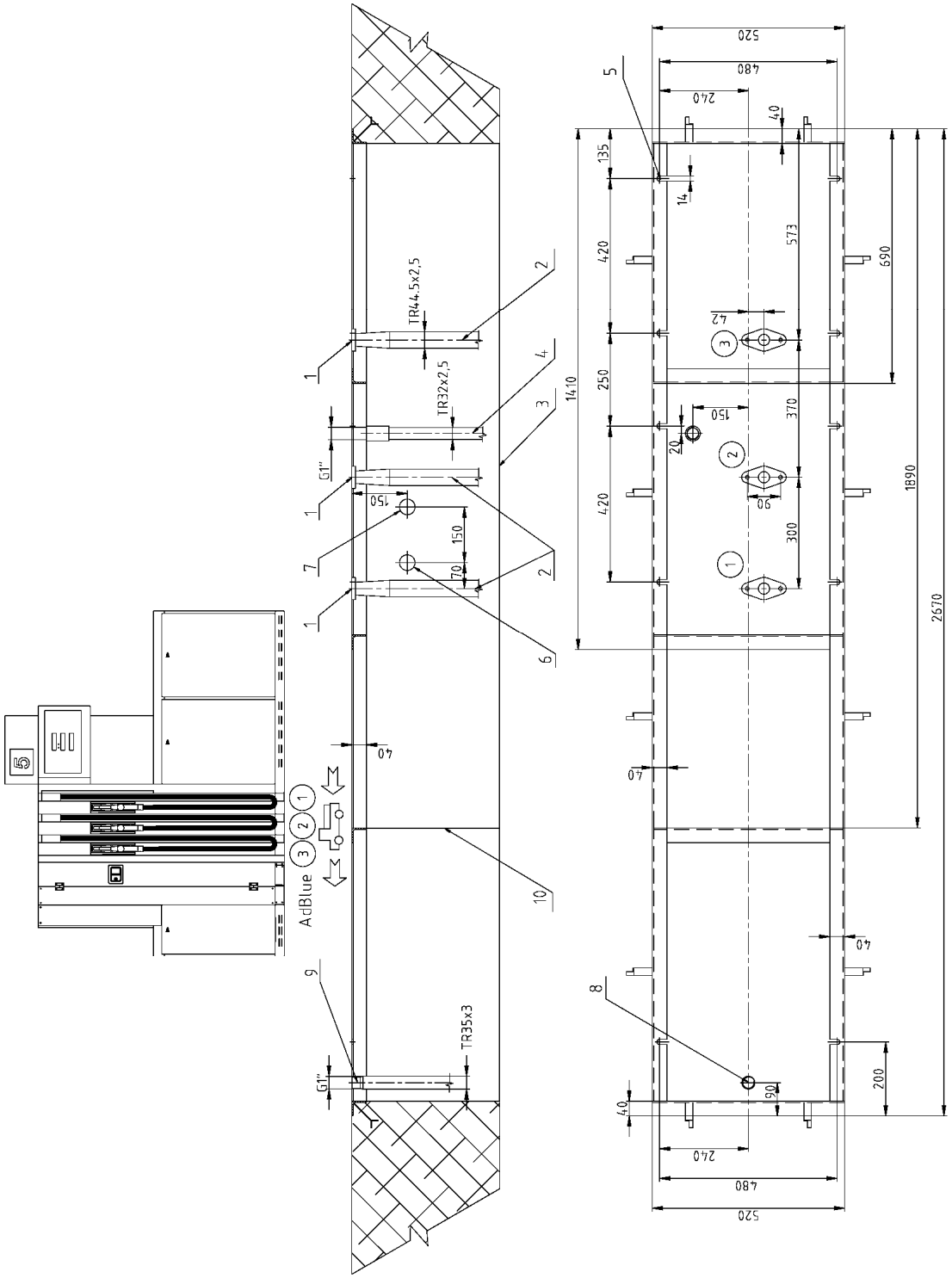
Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	7	Outlet of electrical cables for data transmission
2	Suction piping - TR 44.5 x 2.5	8	Axis of AdBlue® inlet pressure piping
3	Leak catcher tray	9	AdBlue® inlet pressure piping TR 35 x 3 with external thread G1"
4	Vapor recovery piping TR 32 x 2.5 is terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	10	Dividing partition (separating the heated AdBlue® module from the fuel dispenser)
5	Anchoring holes	⇦	Recommended direction of arrival of the vehicles to the dispenser
6	Outlet of electrical cables for dispenser powering		

1.1.2.b. BMP4022.OEL(R)+MOD4011.OEL(R)/AdB & BMP4024.OED+MOD4012.OED/AdB



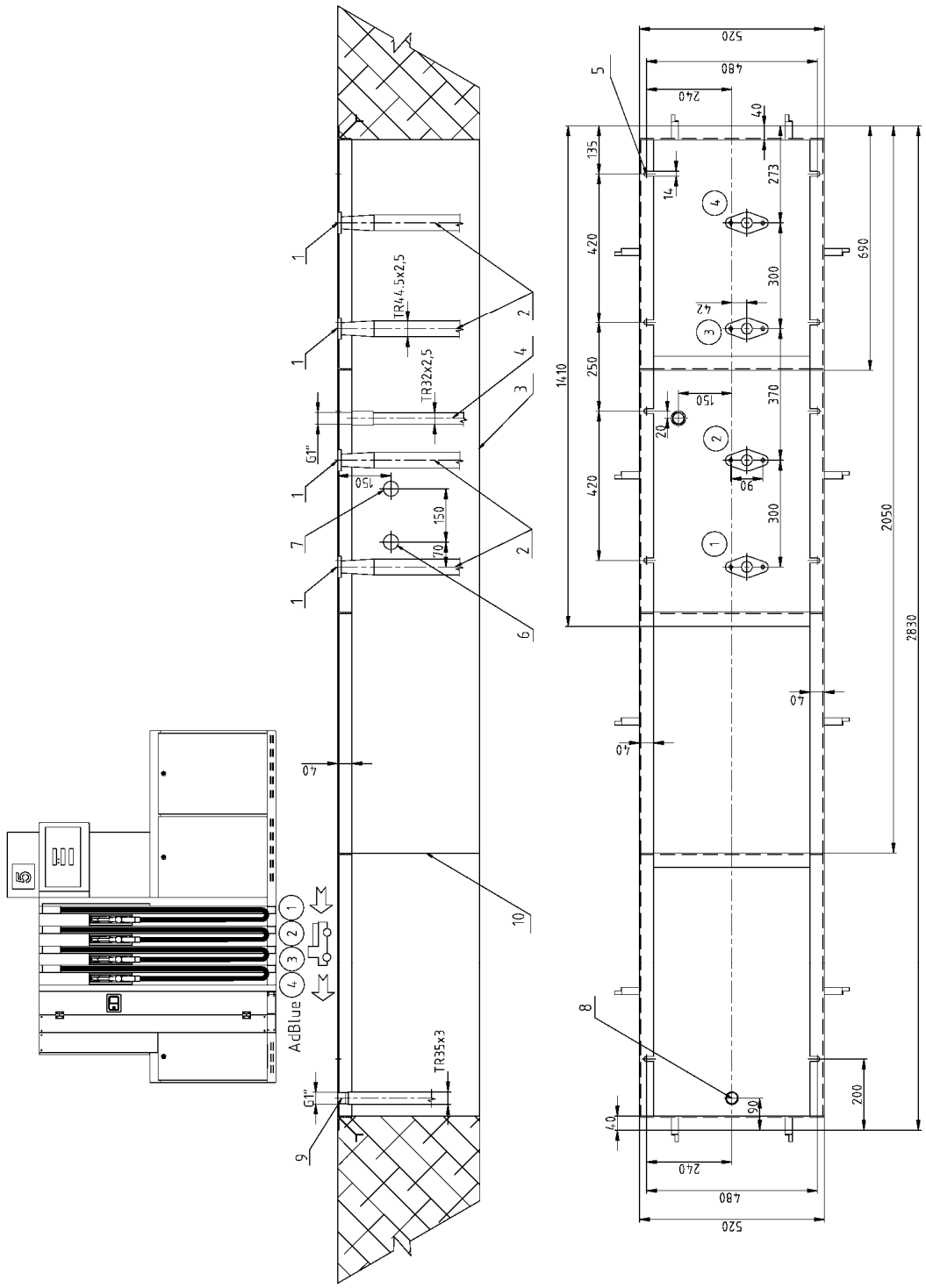
Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	7	Outlet of electrical cables for data transmission
2	Suction piping - TR 44.5 x 2.5	8	Axis of AdBlue® inlet pressure piping
3	Leak catcher tray	9	AdBlue® inlet pressure piping TR 35 x 3 with external thread G1"
4	Vapor recovery piping TR 32 x 2.5 is terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	10	Dividing partition (separating the heated AdBlue® module from the fuel dispenser)
5	Anchoring holes	⇦	Recommended direction of arrival of the vehicles to the dispenser
6	Outlet of electrical cables for dispenser powering	①②	Order of fuel products

1.1.2.c. BMP4033.OEL(R)+MOD4011.OEL(R)/AdB & BMP4036.OED+MOD4012.OED/AdB



Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	7	Outlet of electrical cables for data transmission
2	Suction piping - TR 44.5 x 2.5	8	Axis of AdBlue® inlet pressure piping
3	Leak catcher tray	9	AdBlue® inlet pressure piping TR 35 x 3 with external thread G1"
4	Vapor recovery piping TR 32 x 2.5 is terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	10	Dividing partition (separating the heated AdBlue® module from the fuel dispenser)
5	Anchoring holes	⇦	Recommended direction of arrival of the vehicles to the dispenser
6	Outlet of electrical cables for dispenser powering	①②③	Order of fuel products

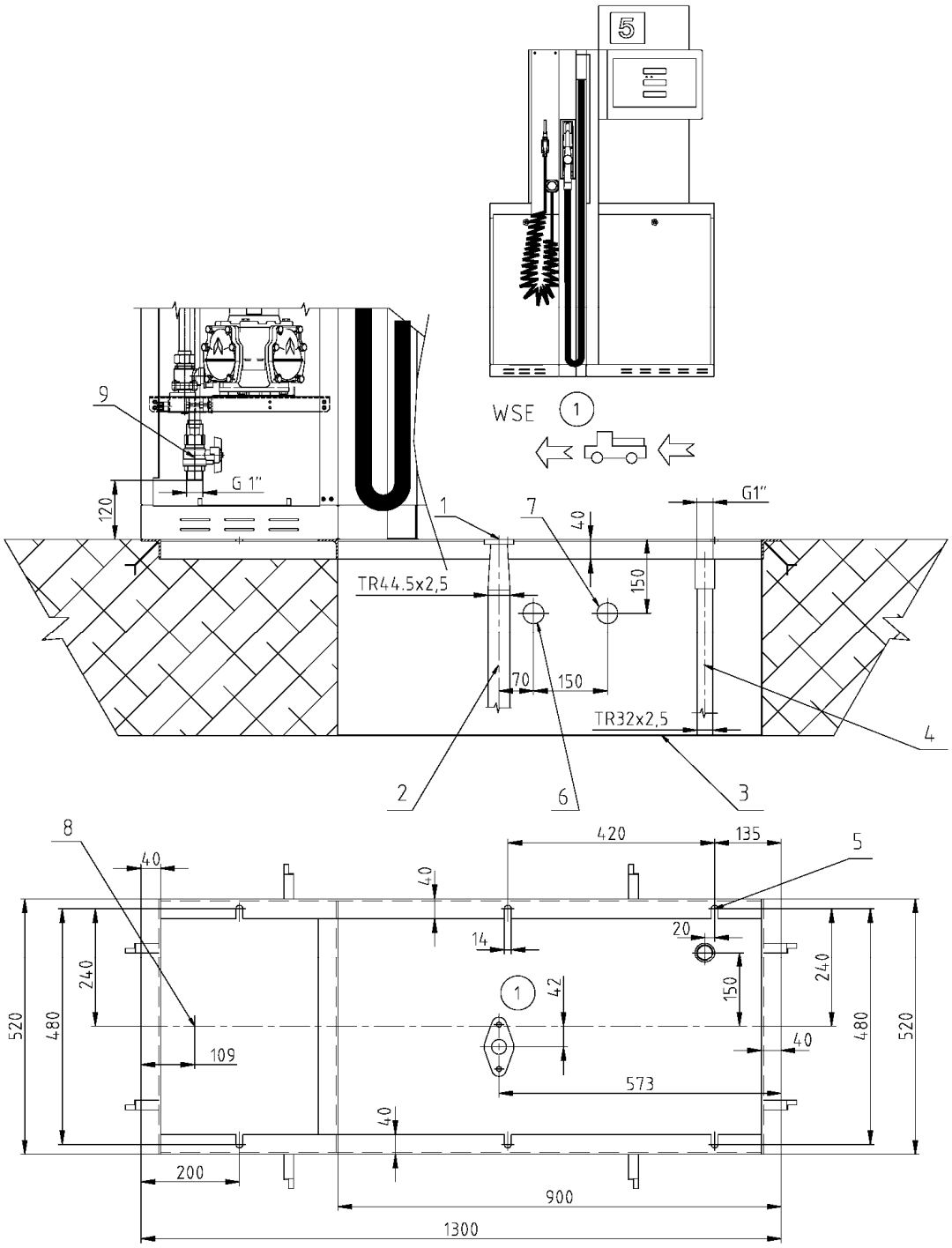
1.1.2.d. BMP4044.OEL(R)+MOD4011.OEL(R)/AdB & BMP4048.OED+MOD4012.OED/AdB



Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	7	Outlet of electrical cables for data transmission
2	Suction piping - TR 44.5 x 2.5	8	Axis of AdBlue® inlet pressure piping
3	Leak catcher tray	9	AdBlue® inlet pressure piping TR 35 x 3 with external thread G1"
4	Vapor recovery piping TR 32 x 2.5 is terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	10	Dividing partition (separating the heated AdBlue® module from the fuel dispenser)
5	Anchoring holes	⇦	Recommended direction of arrival of the vehicles to the dispenser
6	Outlet of electrical cables for dispenser powering	①② ③④	Order of fuel products

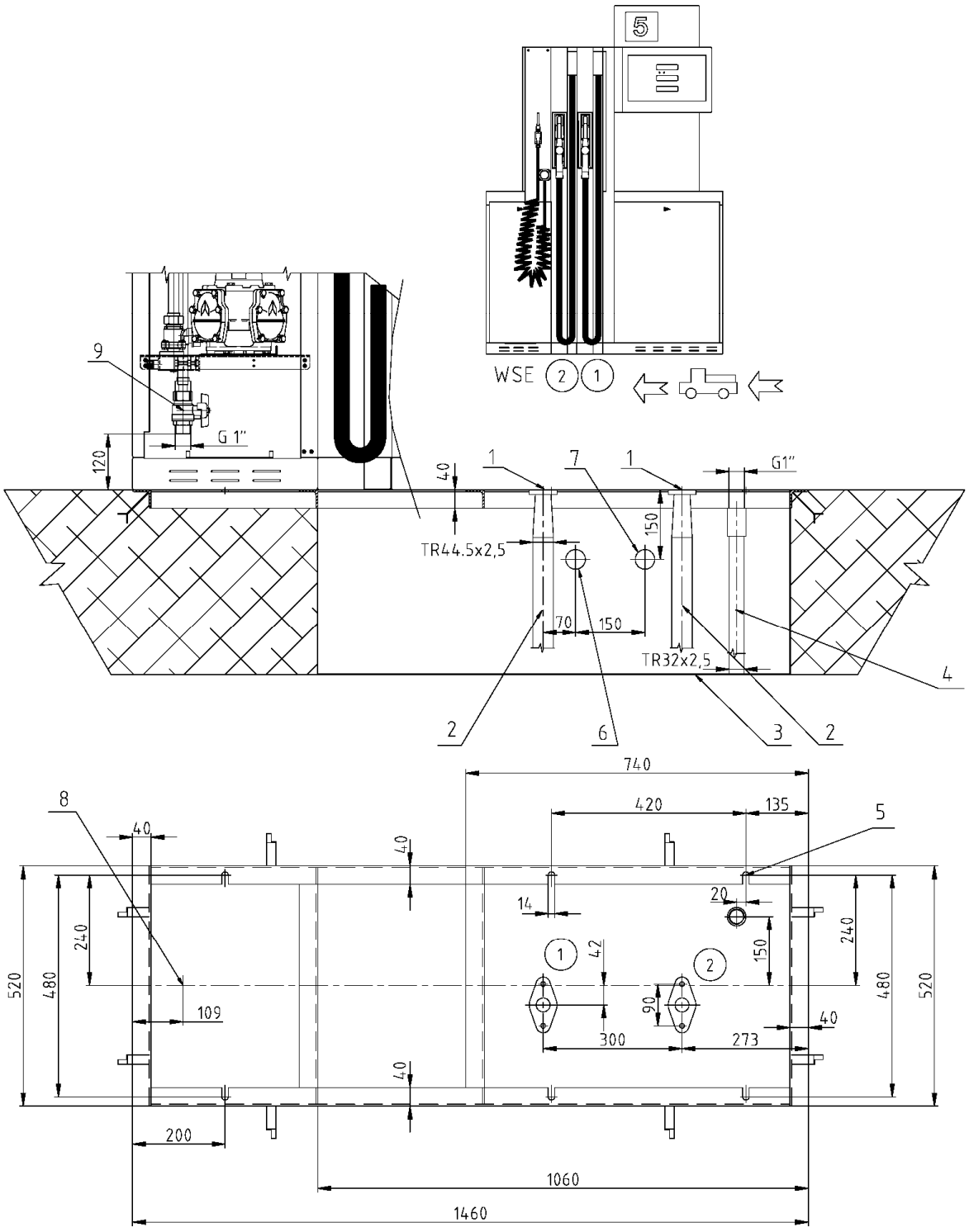
APPENDIX 1.1.3. FOUNDATION PLANS FOR COMBINED DISPENSERS WITH WSE MODULE

1.1.3.a. BMP4011.OEL(R)+MOD4011.OEL(R)/WSE & BMP4012.OED+MOD4012.OED/WSE



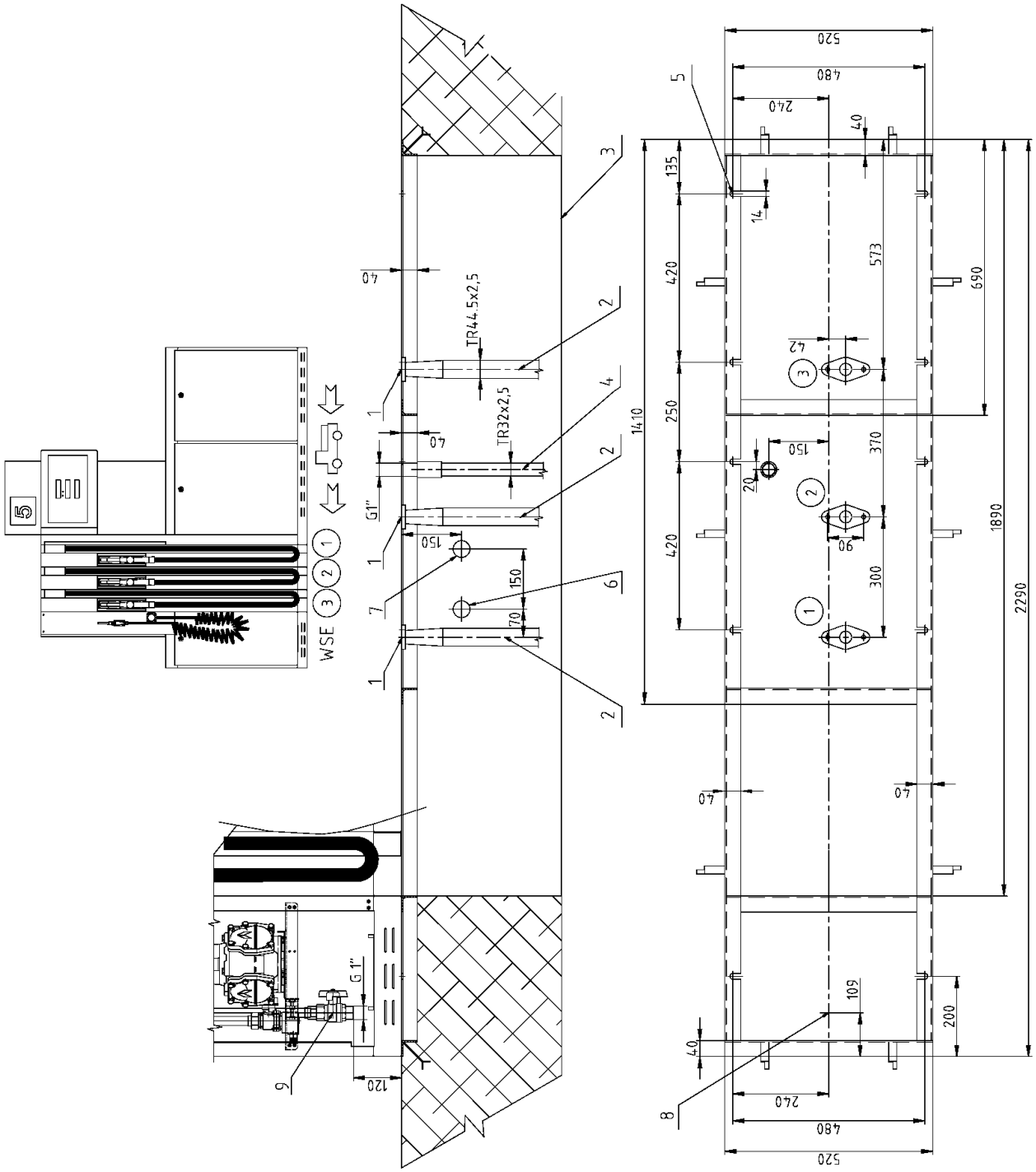
Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	6	Outlet of electrical cables for dispenser powering
2	Suction piping - TR 44.5 x 2.5	7	Outlet of electrical cables for data transmission
3	Leak catcher tray	8	Axis of inlet piping for windshield wiper fluid (WSE)
4	Vapor recovery piping TR 32 x 2.5 is terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	9	Inlet piping for WSE with ball valve, G 1" (external thread)
5	Anchoring holes	⇦	Recommended direction of arrival of the vehicles to the dispenser

1.1.3.b. BMP4022.OEL(R)+MOD4011.OEL(R)/WSE & BMP4024.OED+MOD4012.OED/WSE



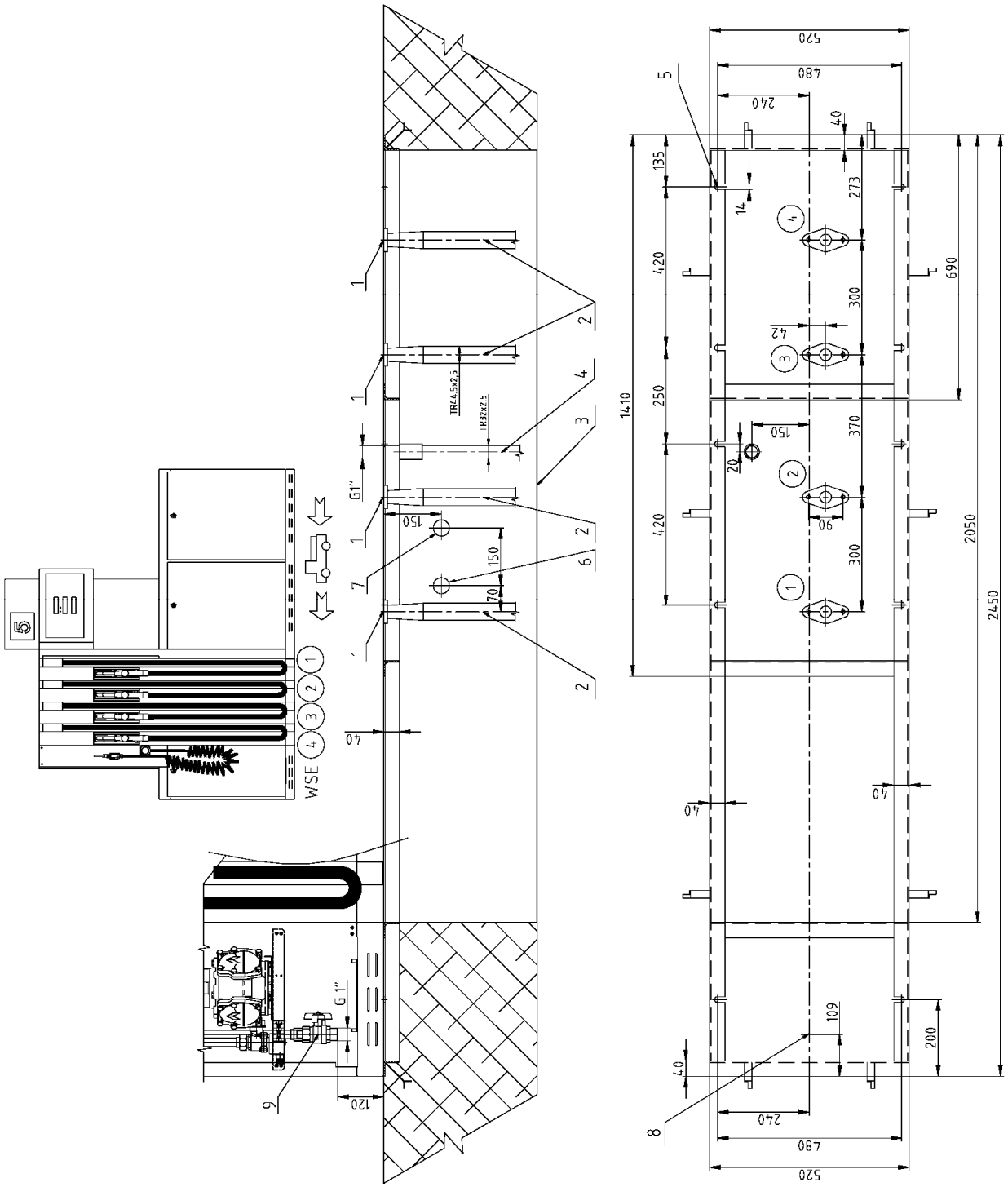
Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	7	Outlet of electrical cables for data transmission
2	Suction piping - TR 44.5 x 2.5	8	Axis of inlet piping for windshield wiper fluid (WSE)
3	Leak catcher tray	9	Inlet piping for WSE with ball valve, G 1" (external thread)
4	Vapor recovery piping TR 32 x 2.5 is terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	⇦	Recommended direction of arrival of the vehicles to the dispenser
5	Anchoring holes	①②	Order of fuel products
6	Outlet of electrical cables for dispenser powering		

1.1.3.c. BMP4033.OEL(R)+MOD4011.OEL(R)/WSE & BMP4036.OED+MOD4012.OED/WSE



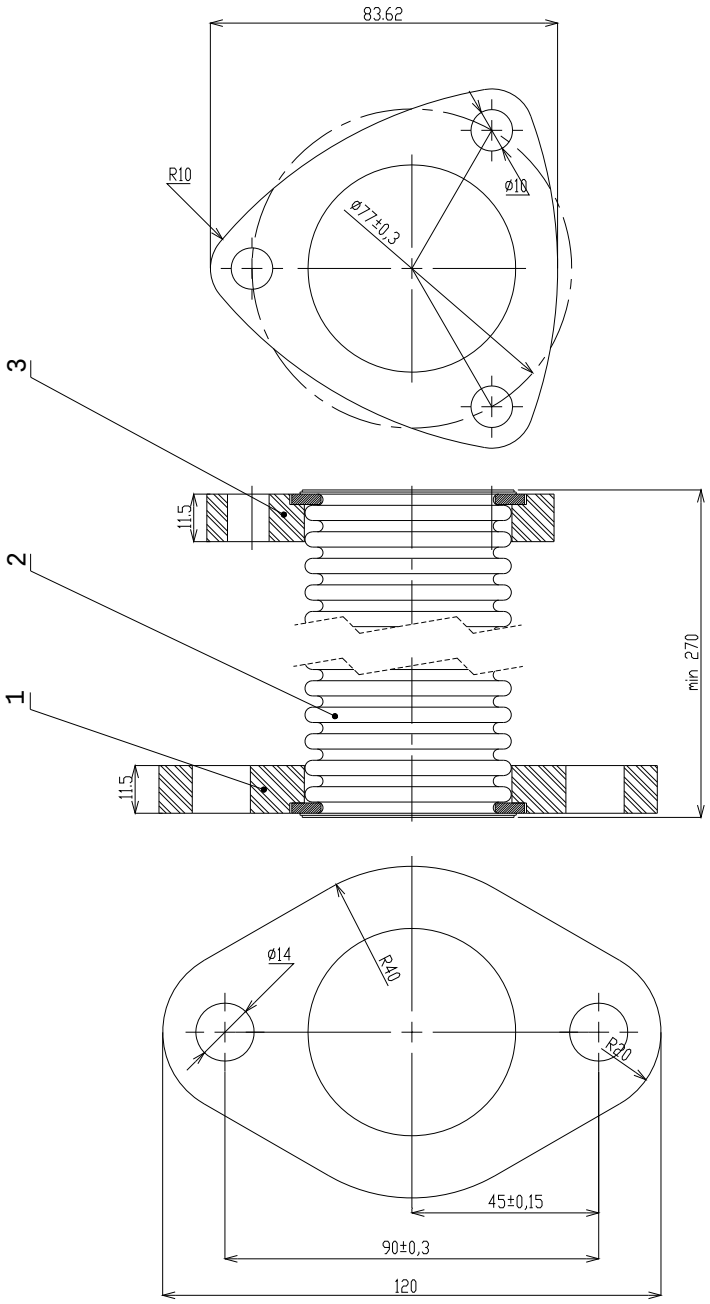
Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	7	Outlet of electrical cables for data transmission
2	Suction piping - TR 44.5 x 2.5	8	Axis of inlet piping for windshield wiper fluid (WSE)
3	Leak catcher tray	9	Inlet piping for WSE with ball valve, G 1" (external thread)
4	Vapor recovery piping TR 32 x 2.5 is terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	⇦	Recommended direction of arrival of the vehicles to the dispenser
5	Anchoring holes	①② ③	Order of fuel products
6	Outlet of electrical cables for dispenser powering		

1.1.3.d. BMP4044.OEL(R)+MOD4011.OEL(R)/WSE & BMP4048.OED+MOD4012.OED/WSE



Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	7	Outlet of electrical cables for data transmission
2	Suction piping - TR 44.5 x 2.5	8	Axis of inlet piping for windshield wiper fluid (WSE)
3	Leak catcher tray	9	Inlet piping for WSE with ball valve, G 1" (external thread)
4	Vapor recovery piping TR 32 x 2.5 is terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	⇦	Recommended direction of arrival of the vehicles to the dispenser
5	Anchoring holes	①② ③④	Order of fuel products
6	Outlet of electrical cables for dispenser powering		

APPENDIX 1.1.4. DRAWING OF THE CONNECTING PIECE (FLEXIBLE PIPE)

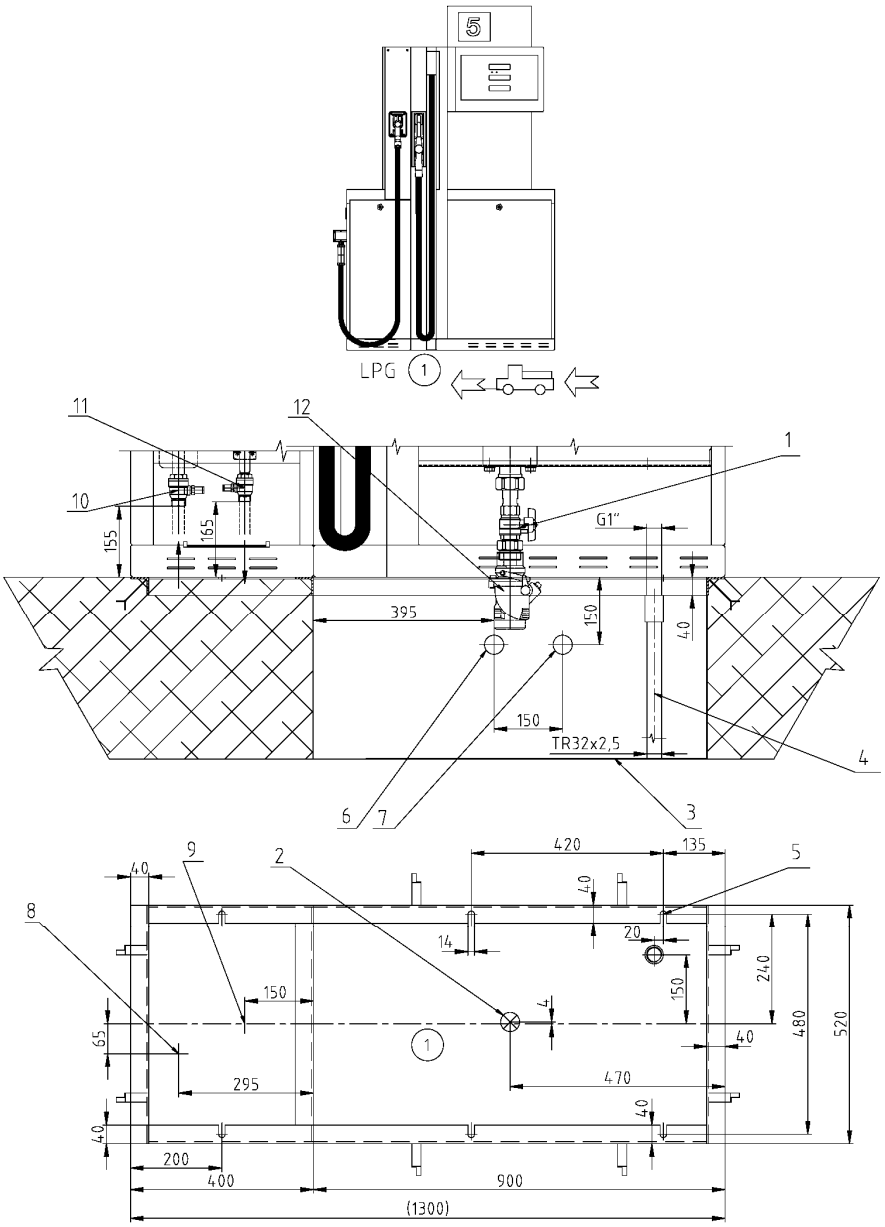


Pos.	Description	Pos.	Description
1	Oval flange for connecting to the suction fuel piping	3	Flange for connecting to the inlet of the pumping monoblock
2	Flexible piping – flexible pipe		

APPENDIX 1.2. FOUNDATION PLANS FOR DISPENSERS IN PRESSURE MODEL WITHOUT PUMPS

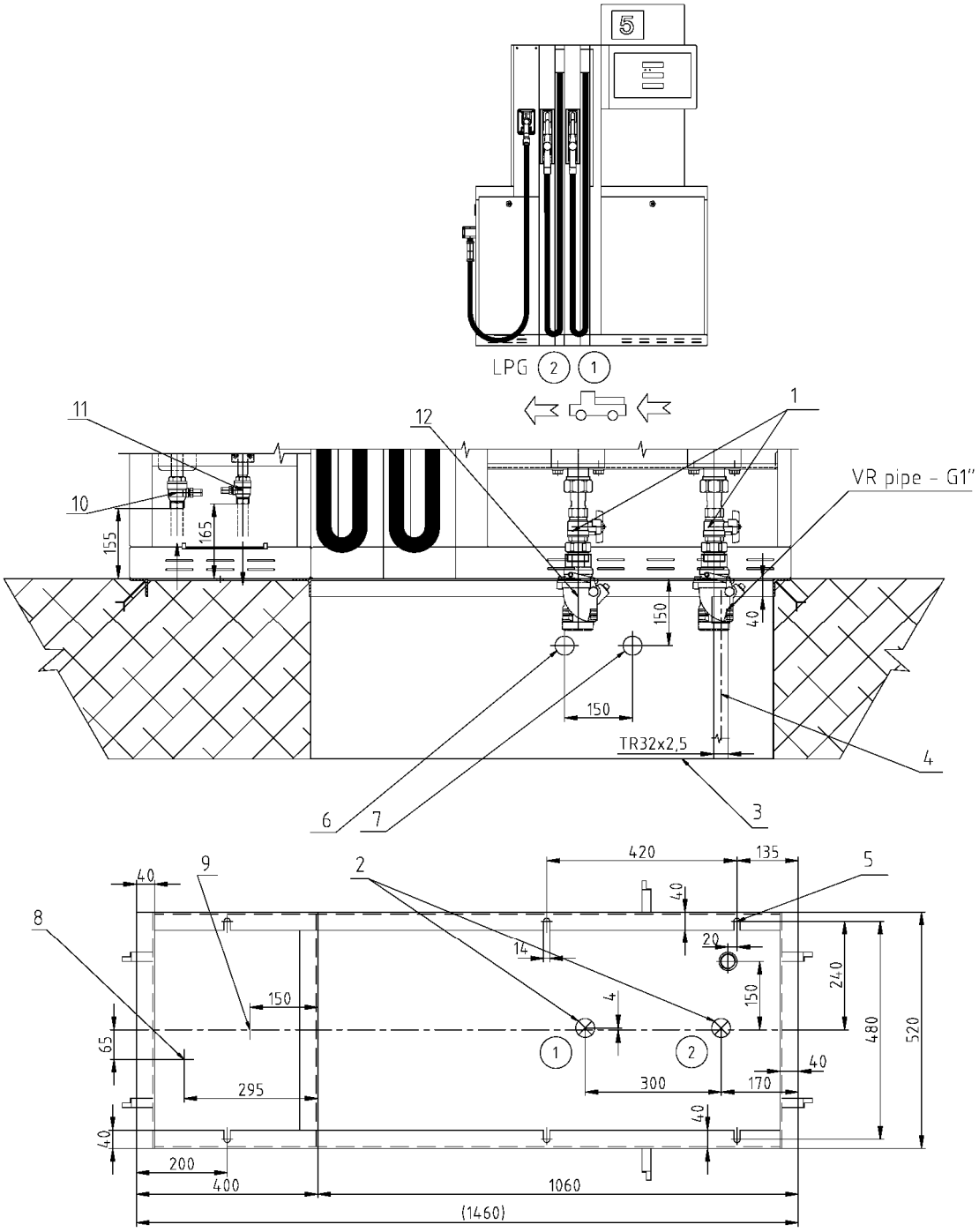
APPENDIX 1.2.1. FOUNDATION PLANS OF PRESSURE COMBI DISPENSERS WITH LPG MODULE

1.2.1.a. BMP4011.OEL(R)/S3+MOD4011.OEL(R)/LPG & BMP4012.OED/S3+MOD4012.OED/LPG



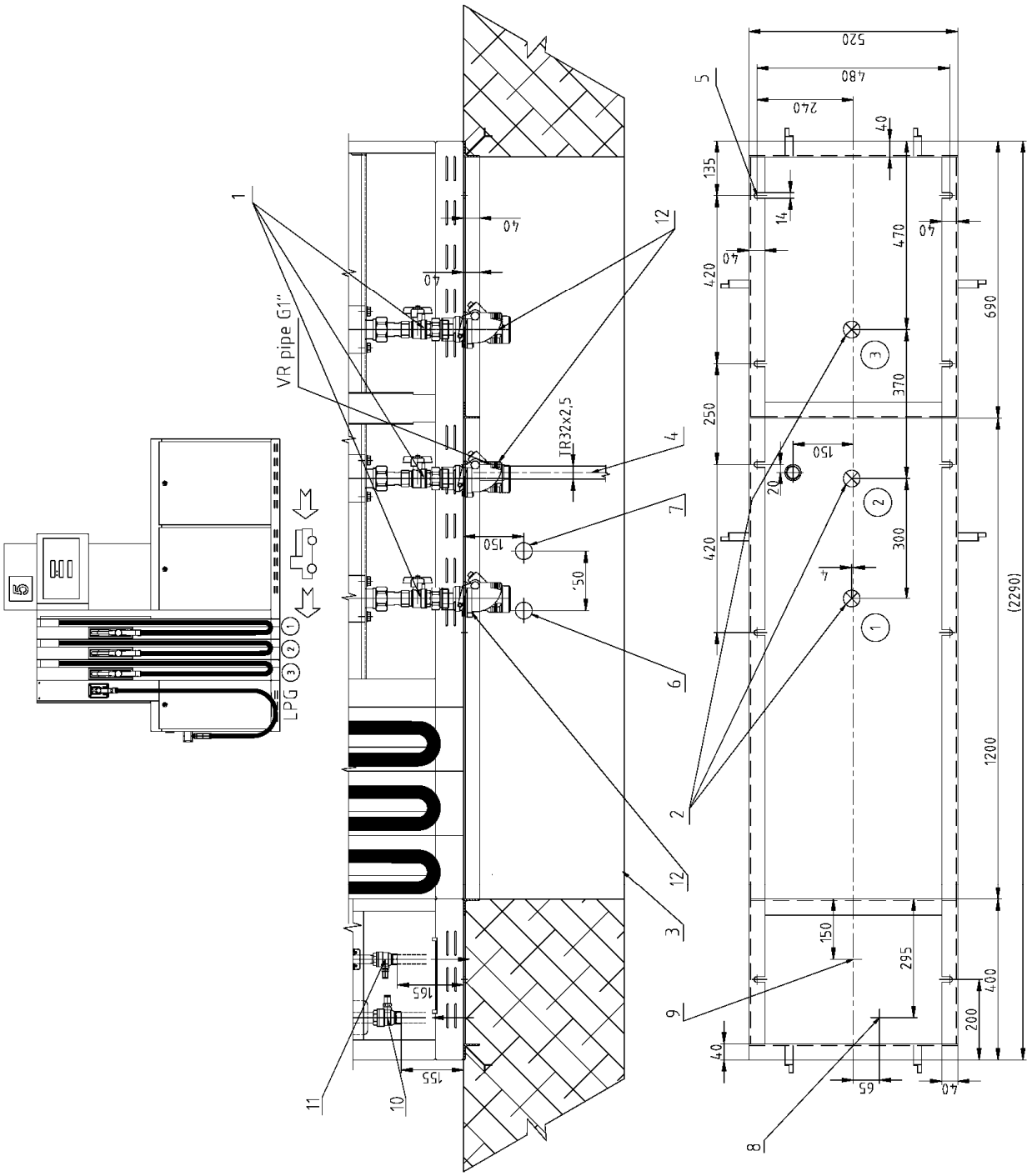
Pos.	Description	Pos.	Description
1	Inlet piping with adjustable height terminated by a ball valve and adapter from G1" to G1 ½" (detail in Appendix 1.2.4.)	8	Axis of LPG inlet piping LPG for liquid phase
2	Axis of inlet pressure piping	9	Axis of Return piping for gaseous phase LPG
3	Leak catcher tray	10	Inlet ball valve for LPG liquid phase G 3/4" (internal thread)
4	Vapor recovery piping TR 32 x 2.5 is terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	11	Outlet ball valve for LPG gaseous phase G 1/2" (internal thread)
5	Anchoring holes	12	Breakaway valve OPW 10BF firmly connected to the base (not a part of the standard dispenser supply)
6	Outlet of electrical cables for dispenser powering	⇦	Recommended direction of arrival of the vehicles to the dispenser
7	Outlet of electrical cables for data transmission		

1.2.1.b. BMP4022.OEL(R)/S3+MOD4011.OEL(R)/LPG & BMP4024.OED/S3+MOD4012.OED/LPG



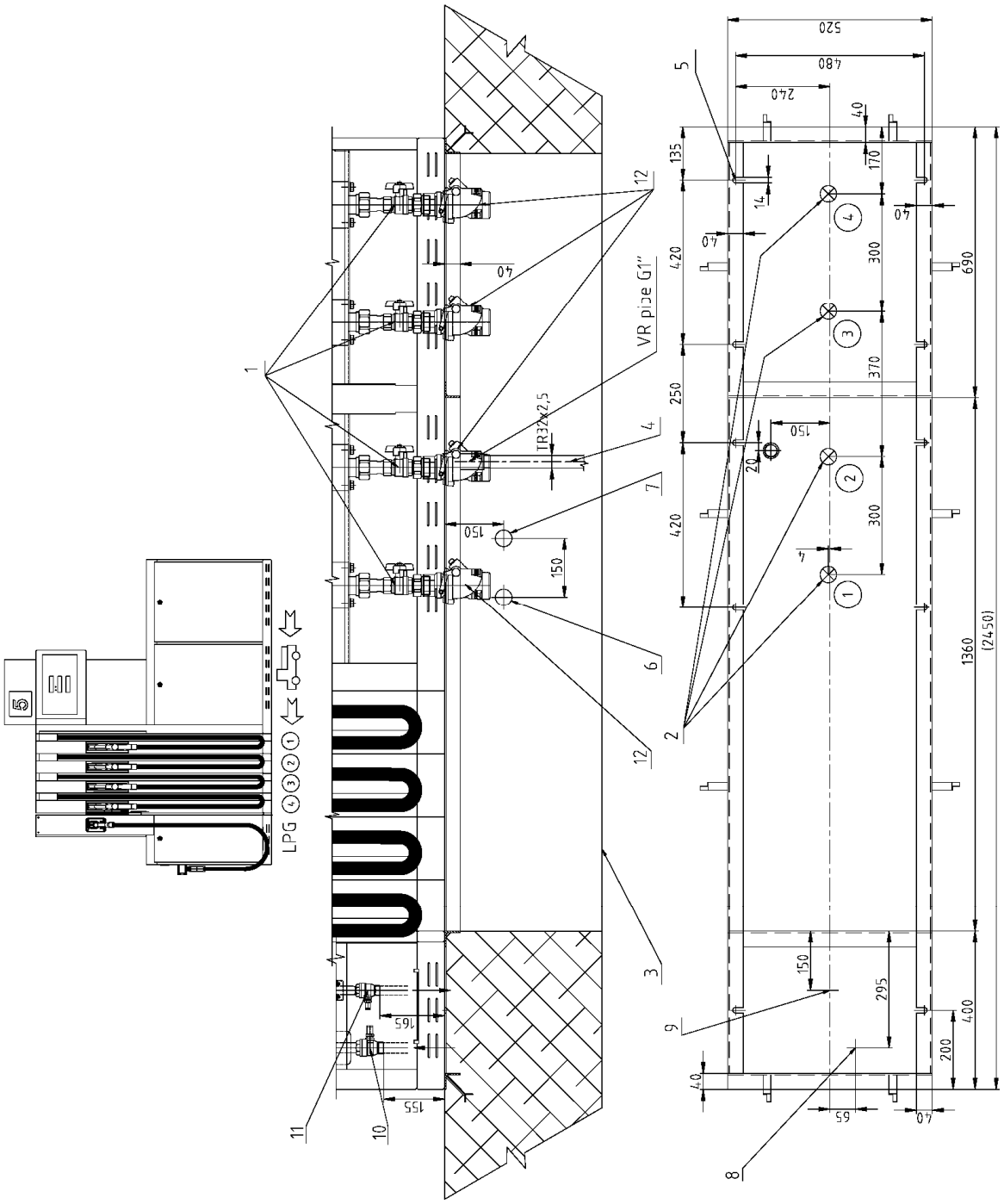
Pos.	Description	Pos.	Description
1	Inlet piping with adjustable height terminated by a ball valve and adapter from G1" to G1 ½" (detail in Appendix 1.2.4.)	8	Axis of LPG inlet piping LPG for liquid phase
2	Axis of inlet pressure piping	9	Axis of Return piping for gaseous phase LPG
3	Leak catcher tray	10	Inlet ball valve for LPG liquid phase G 3/4" (internal thread)
4	Vapor recovery piping TR 32 x 2.5 is terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	11	Outlet ball valve for LPG gaseous phase G 1/2" (internal thread)
5	Anchoring holes	12	Breakaway valve OPW 10BF firmly connected to the base (not a part of the standard dispenser supply)
6	Outlet of electrical cables for dispenser powering	⇦	Recommended direction of arrival of the vehicles to the dispenser
7	Outlet of electrical cables for data transmission	①②	Order of fuel products

1.2.1.c. BMP4033.OEL(R)/S3+MOD4011.OEL(R)/LPG & BMP4036.OED/S3+MOD4012.OED/LPG



Pos.	Description	Pos.	Description
1	Inlet piping with adjustable height terminated by a ball valve and adapter from G1“ to G1 ½“ (detail in Appendix 1.2.4.)	8	Axis of LPG inlet piping LPG for liquid phase
2	Axis of inlet pressure piping	9	Axis of Return piping for gaseous phase LPG
3	Leak catcher tray	10	Inlet ball valve for LPG liquid phase G 3/4" (internal thread)
4	Vapor recovery piping TR 32 x 2.5 is terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	11	Outlet ball valve for LPG gaseous phase G 1/2" (internal thread)
5	Anchoring holes	12	Breakaway valve OPW 10BF firmly connected to the base (not a part of the standard dispenser supply)
6	Outlet of electrical cables for dispenser powering	⇦	Recommended direction of arrival of the vehicles to the dispenser
7	Outlet of electrical cables for data transmission	①②③	Order of fuel products

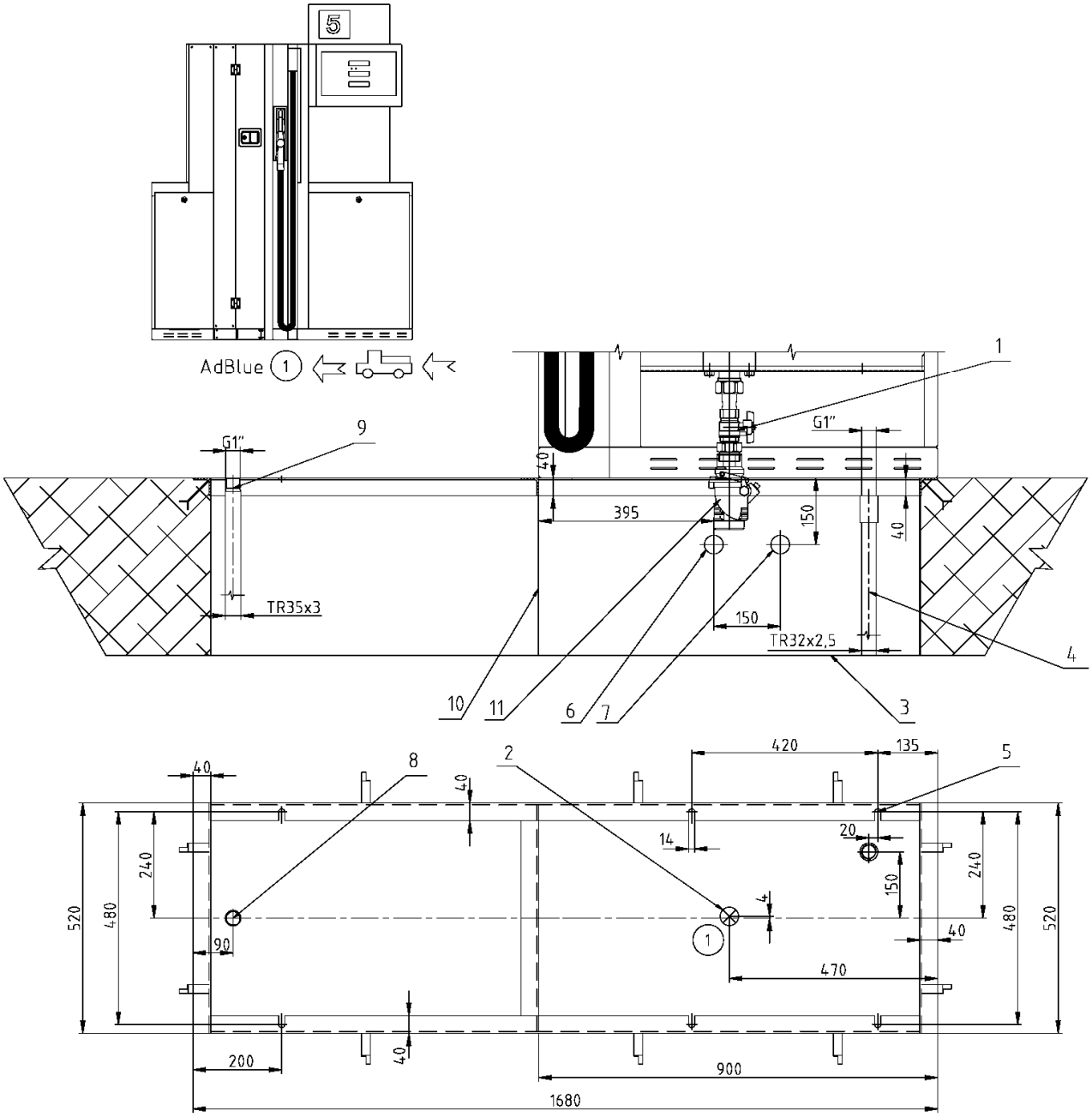
1.2.1.d. BMP4044.OEL(R)/S3+MOD4011.OEL(R)/LPG & BMP4048.OED/S3+MOD4012.OED/LPG



Pos.	Description	Pos.	Description
1	Inlet piping with adjustable height terminated by a ball valve and adapter from G1“ to G1 ½“ (detail in Appendix 1.2.4.)	8	Axis of LPG inlet piping LPG for liquid phase
2	Axis of inlet pressure piping	9	Axis of Return piping for gaseous phase LPG
3	Leak catcher tray	10	Inlet ball valve for LPG liquid phase G 3/4" (internal thread)
4	Vapor recovery piping TR 32 x 2.5 is terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	11	Outlet ball valve for LPG gaseous phase G 1/2" (internal thread)
5	Anchoring holes	12	Breakaway valve OPW 10BF firmly connected to the base (not a part of the standard dispenser supply)
6	Outlet of electrical cables for dispenser powering	⇦	Recommended direction of arrival of the vehicles to the dispenser
7	Outlet of electrical cables for data transmission	①② ③④	Order of fuel products

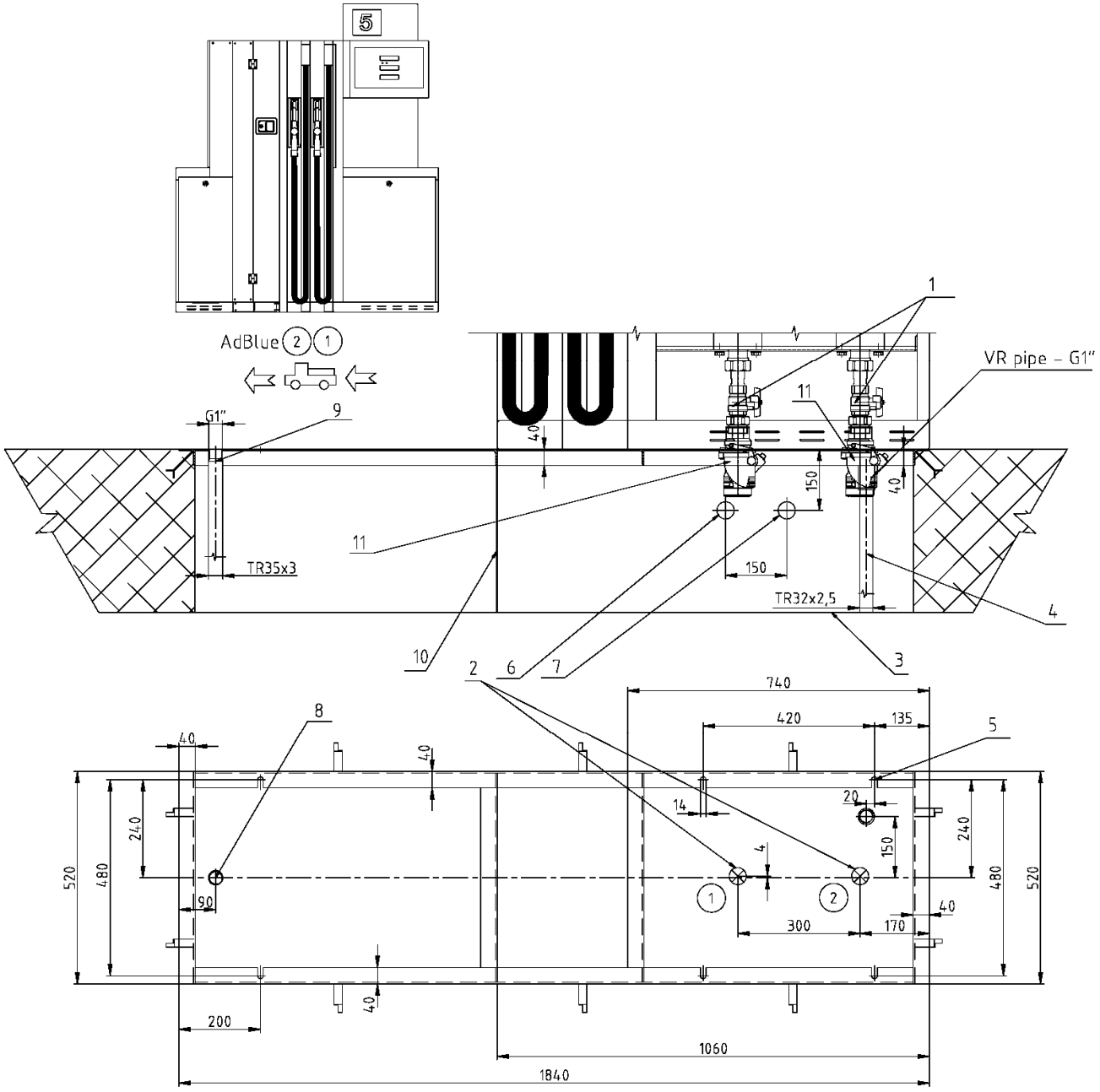
APPENDIX 1.2.2. FOUNDATION PLANS OF PRESSURE COMBI DISPENSERS WITH ADBLUE® MODULE

1.2.2.a. BMP4011.OEL(R)/S3+MOD4011.OEL(R)/AdB & BMP4012.OED/S3+MOD4012.OED/AdB



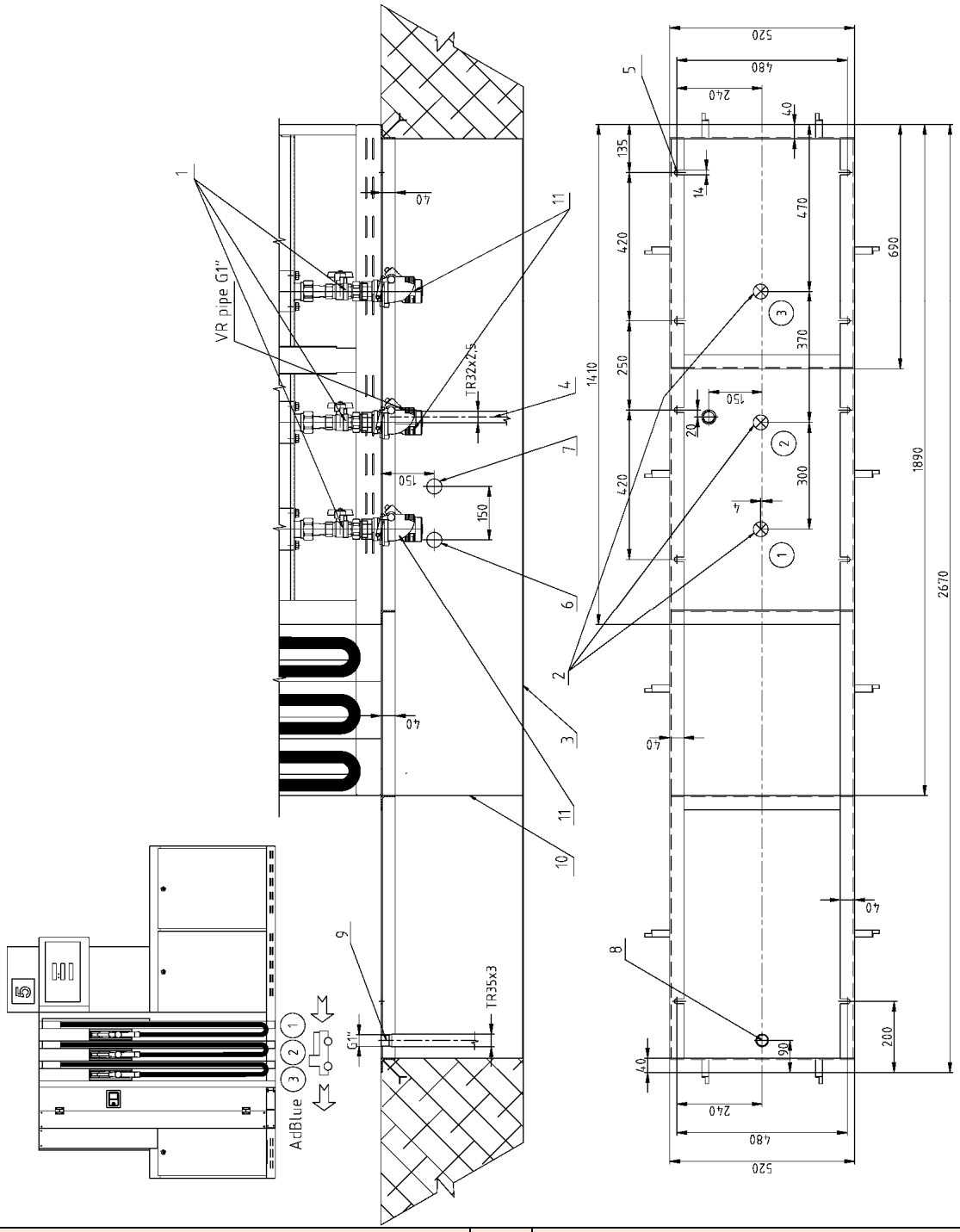
Pos.	Description	Pos.	Description
1	Inlet piping with adjustable height terminated by a ball valve and adapter from G1“ to G1 ½“ (detail in Appendix 1.2.4.)	7	Outlet of electrical cables for data transmission
2	Axis of inlet pressure piping	8	Axis of AdBlue® inlet pressure piping
3	Leak catcher tray	9	AdBlue® inlet pressure piping TR 35 x 3 with external thread G1"
4	Vapor recovery piping TR 32 x 2.5 is terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	10	Dividing partition (separating the heated AdBlue® module from the fuel dispenser)
5	Anchoring holes	11	Breakaway valve OPW 10BF firmly connected to the base (not a part of the standard dispenser supply)
6	Outlet of electrical cables for dispenser powering	⇦	Recommended direction of arrival of the vehicles to the dispenser

1.2.2.b. BMP4022.OEL(R)/S3+MOD4011.OEL(R)/AdB & BMP4024.OED/S3+MOD4012.OED/AdB



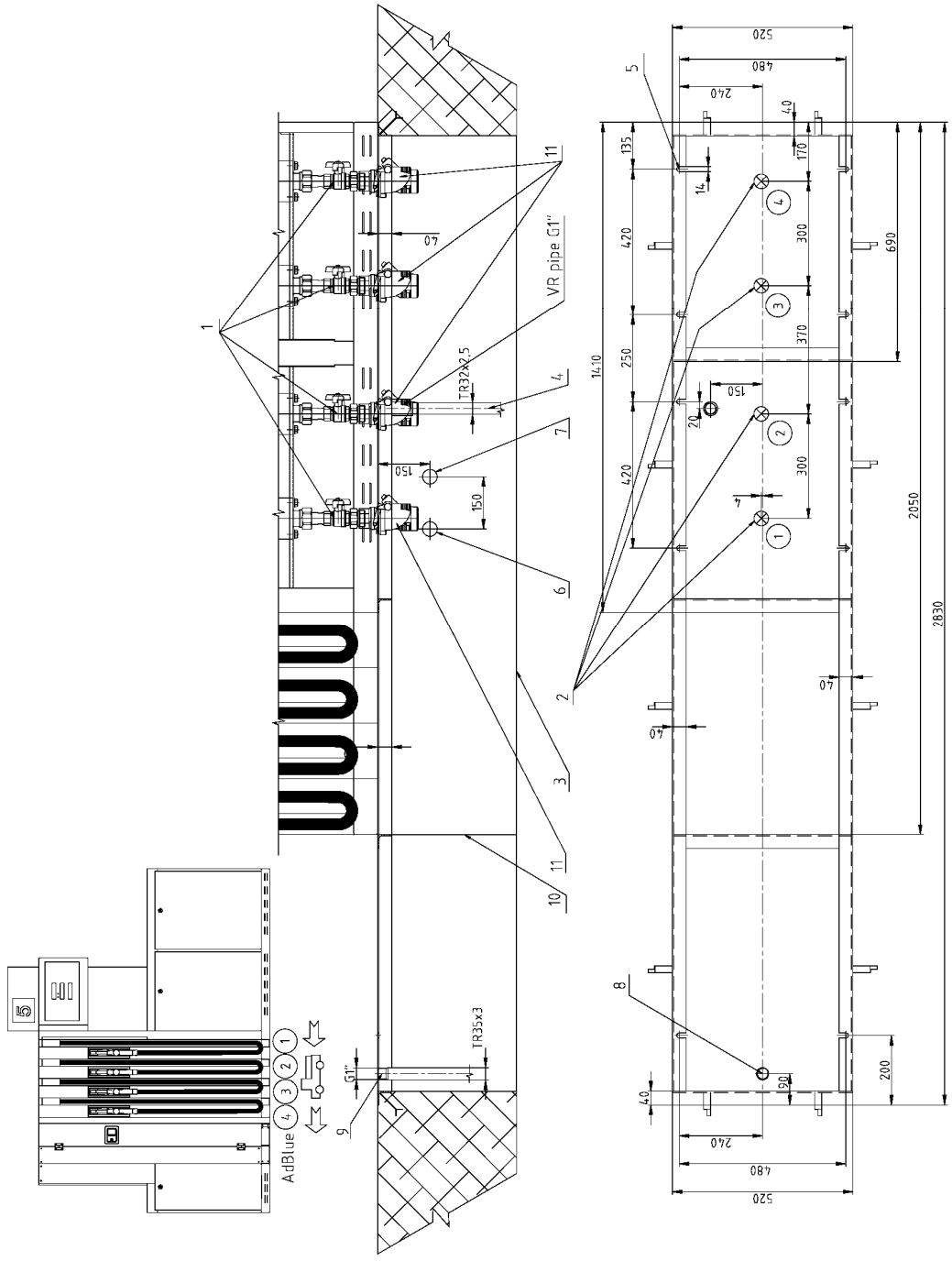
Pos.	Description	Pos.	Description
1	Inlet piping with adjustable height terminated by a ball valve and adapter from G1“ to G1 ½“ (detail in Appendix 1.2.4.)	8	Axis of AdBlue® inlet pressure piping
2	Axis of inlet pressure piping	9	AdBlue® inlet pressure piping TR 35 x 3 with external thread G1"
3	Leak catcher tray	10	Dividing partition (separating the heated AdBlue® module from the fuel dispenser)
4	Vapor recovery piping TR 32 x 2.5 is terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	11	Breakaway valve OPW 10BF firmly connected to the base (not a part of the standard dispenser supply)
5	Anchoring holes	⇦	Recommended direction of arrival of the vehicles to the dispenser
6	Outlet of electrical cables for dispenser powering	①②	Order of fuel products
7	Outlet of electrical cables for data transmission		

1.2.2.c. BMP4033.OEL(R)/S3+MOD4011.OEL(R)/AdB & BMP4036.OED/S3+MOD4012.OED/AdB



Pos.	Description	Pos.	Description
1	Inlet piping with adjustable height terminated by a ball valve and adapter from G1“ to G1 ½“ (detail in Appendix 1.2.4.)	8	Axis of AdBlue® inlet pressure piping
2	Axis of inlet pressure piping	9	AdBlue® inlet pressure piping TR 35 x 3 with external thread G1"
3	Leak catcher tray	10	Dividing partition (separating the heated AdBlue® module from the fuel dispenser)
4	Vapor recovery piping TR 32 x 2.5 is terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	11	Breakaway valve OPW 10BF firmly connected to the base (not a part of the standard dispenser supply)
5	Anchoring holes	⇦	Recommended direction of arrival of the vehicles to the dispenser
6	Outlet of electrical cables for dispenser powering	①② ③	Order of fuel products
7	Outlet of electrical cables for data transmission		

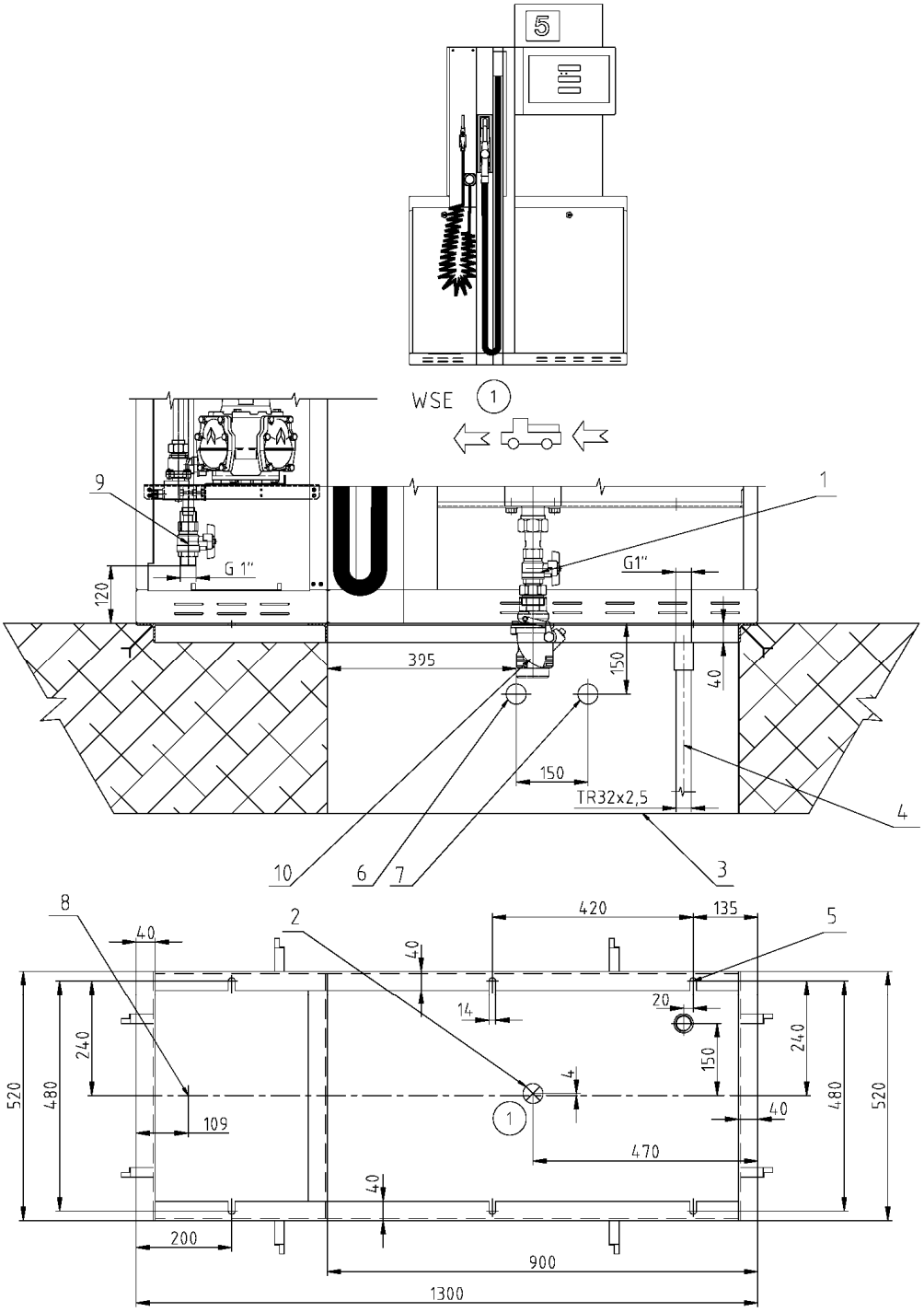
1.2.2.d. BMP4044.OEL(R)/S3+MOD4011.OEL(R)/AdB & BMP4048.OED/S3+MOD4012.OED/AdB



Pos.	Description	Pos.	Description
1	Inlet piping with adjustable height terminated by a ball valve and adapter from G1" to G1 ½" (detail in Appendix 1.2.4.)	8	Axis of AdBlue® inlet pressure piping
2	Axis of inlet pressure piping	9	AdBlue® inlet pressure piping TR 35 x 3 with external thread G1"
3	Leak catcher tray	10	Dividing partition (separating the heated AdBlue® module from the fuel dispenser)
4	Vapor recovery piping TR 32 x 2.5 is terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	11	Breakaway valve OPW 10BF firmly connected to the base (not a part of the standard dispenser supply)
5	Anchoring holes	⇦	Recommended direction of arrival of the vehicles to the dispenser
6	Outlet of electrical cables for dispenser powering	①② ③④	Order of fuel products
7	Outlet of electrical cables for data transmission		

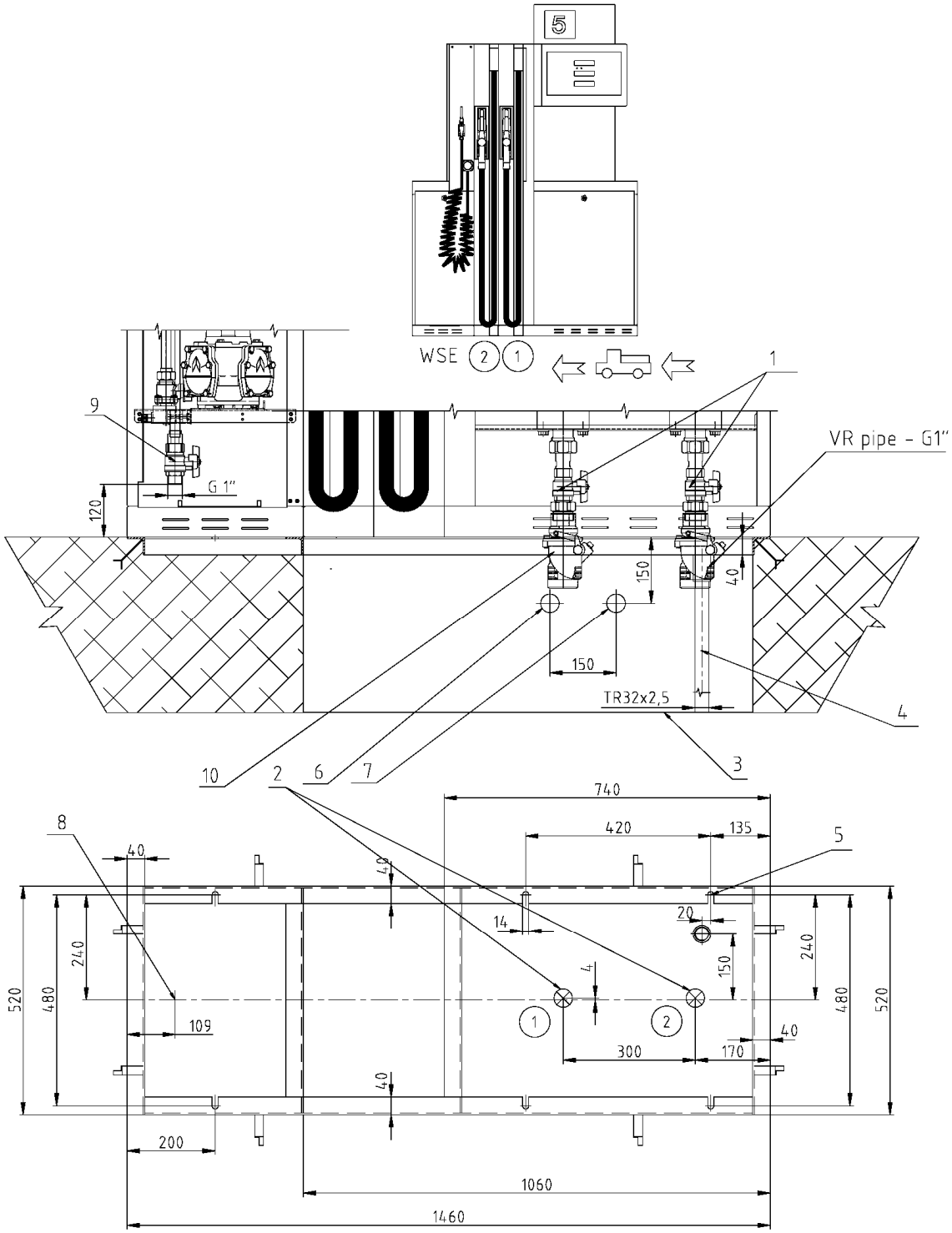
APPENDIX 1.2.3. FOUNDATION PLANS FOR PRESSURE COMBI DISPENSERS WITH WSE MODULE

1.2.3.a. BMP4011.OEL(R)/S3+MOD4011.OEL(R)/WSE & BMP4012.OED/S3+MOD4012.OED/WSE



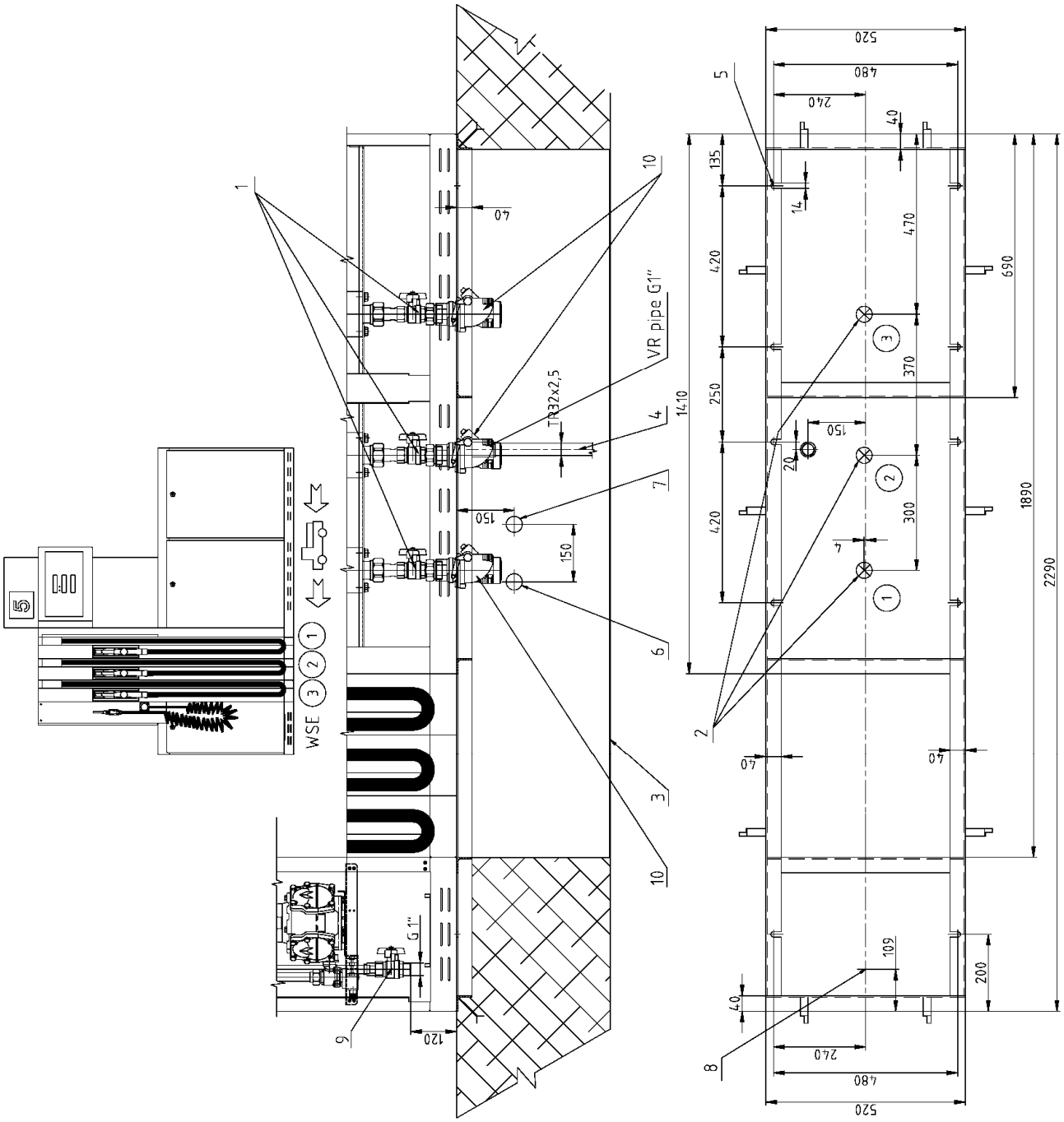
Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	7	Outlet of electrical cables for data transmission
2	Suction piping - TR 44.5 x 2.5	8	Axis of inlet piping for windshield wiper fluid (WSE)
3	Leak catcher tray	9	Inlet piping for WSE with ball valve, G 1" (external thread)
4	Vapor recovery piping TR 32 x 2.5 terminated by an internal thread G1" (not in dispensers made for dispensing diesel)	10	Breakaway valve OPW 10BF firmly connected to the base (not a part of the standard dispenser supply)
5	Anchoring holes	⇦	Recommended direction of arrival of the vehicles to the dispenser
6	Outlet of electrical cables for dispenser powering	①	Order of fuel products

1.2.3.b. BMP4022.OEL(R)/S3+MOD4011.OEL(R)/WSE & BMP4024.OED/S3+MOD4012.OED/WSE



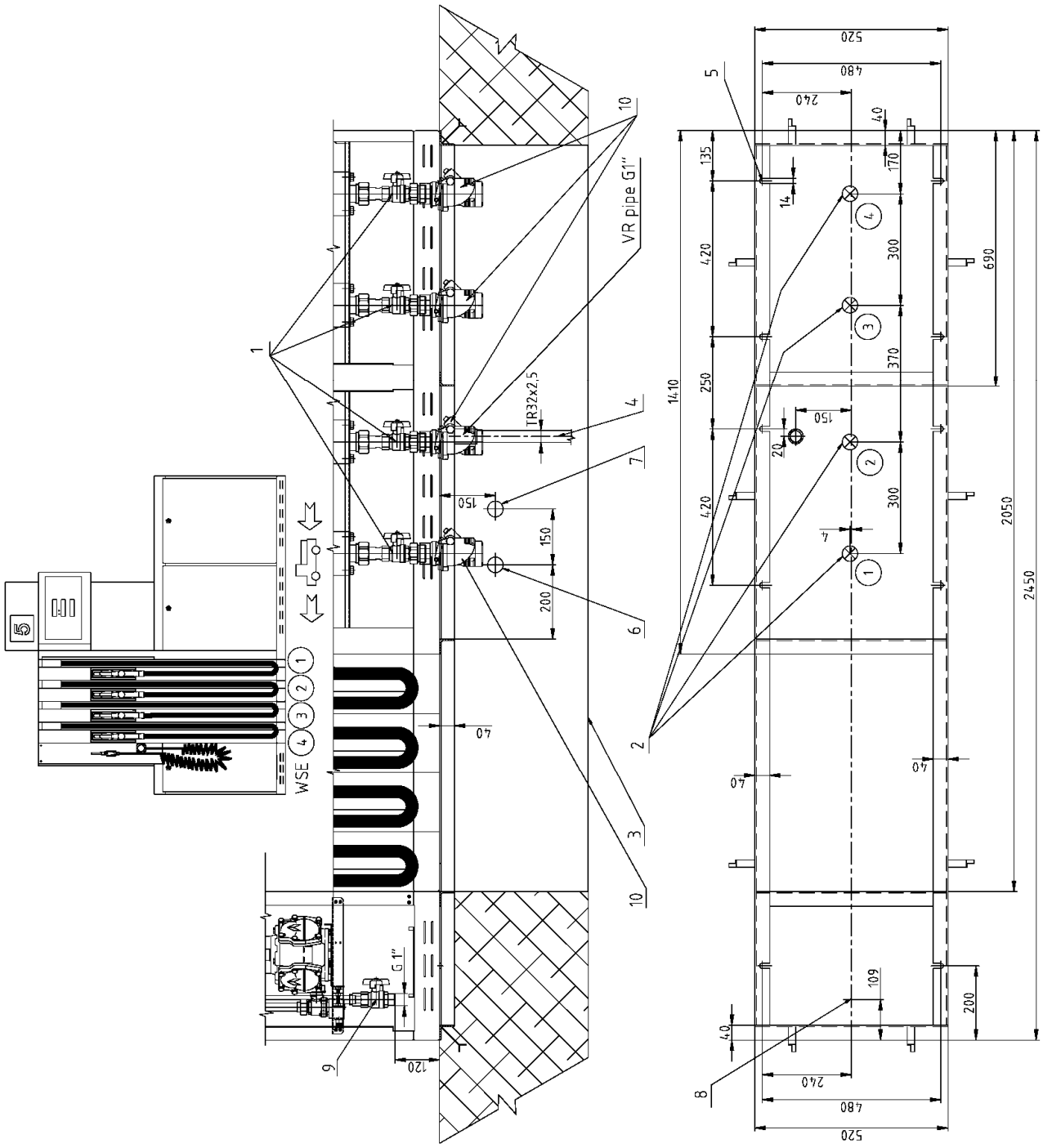
Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	7	Outlet of electrical cables for data transmission
2	Suction piping - TR 44.5 x 2.5	8	Axis of inlet piping for windshield wiper fluid (WSE)
3	Leak catcher tray	9	Inlet piping for WSE with ball valve, G 1" (external thread)
4	Vapor recovery piping TR 32 x 2.5 is terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	10	Breakaway valve OPW 10BF firmly connected to the base (not a part of the standard dispenser supply)
5	Anchoring holes	⇦	Recommended direction of arrival of the vehicles to the dispenser
6	Outlet of electrical cables for dispenser powering	①②	Order of fuel products

1.2.3.c. BMP4033.OEL(R)/S3+MOD4011.OEL(R)/WSE & BMP4036.OED/S3+MOD4012.OED/WSE



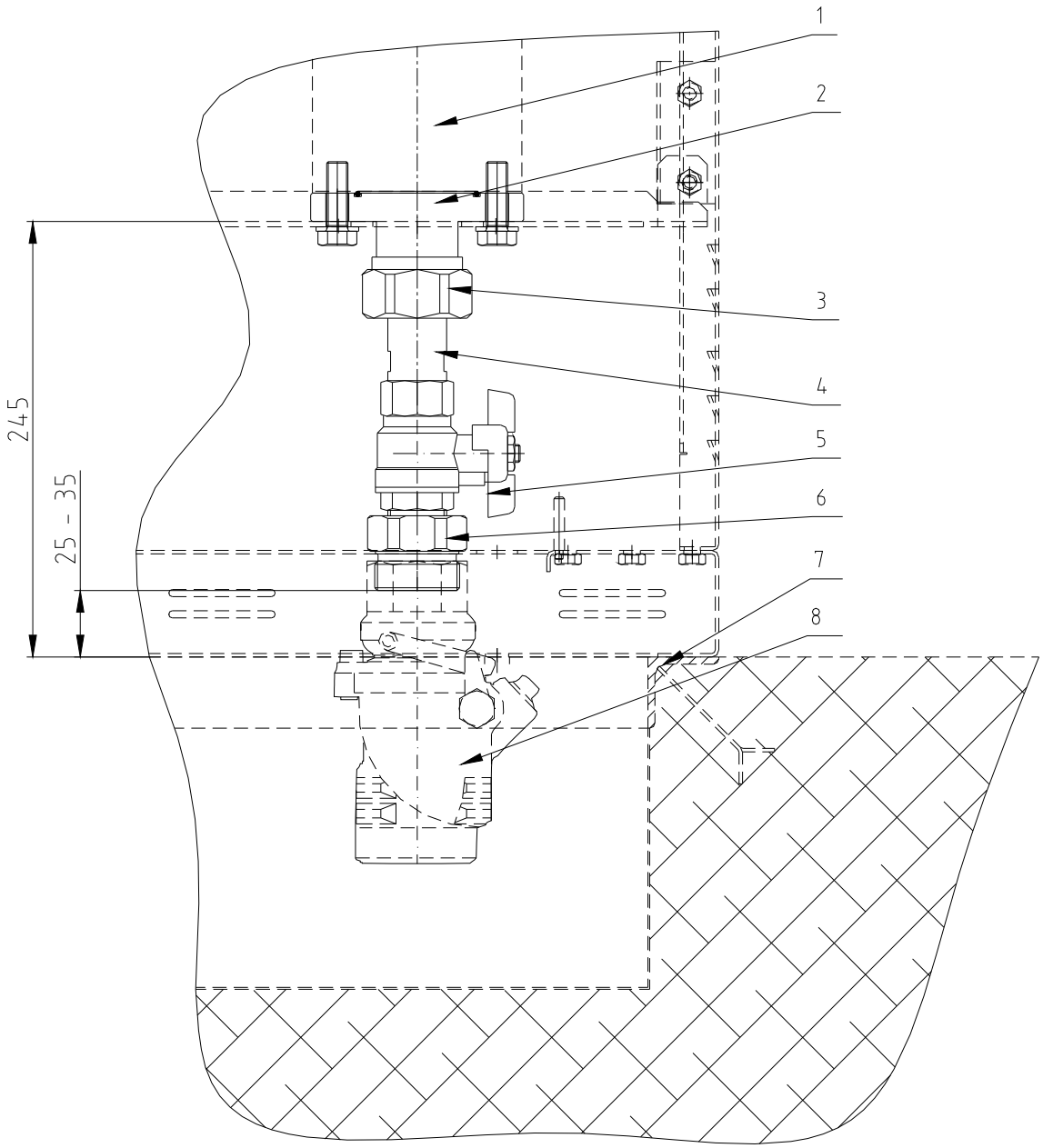
Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	7	Outlet of electrical cables for data transmission
2	Suction piping - TR 44.5 x 2.5	8	Axis of inlet piping for windshield wiper fluid (WSE)
3	Leak catcher tray	9	Inlet piping for WSE with ball valve, G 1" (external thread)
4	Vapor recovery piping TR 32 x 2.5 is terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	10	Breakaway valve OPW 10BF firmly connected to the base (not a part of the standard dispenser supply)
5	Anchoring holes	⇦	Recommended direction of arrival of the vehicles to the dispenser
6	Outlet of electrical cables for dispenser powering	①② ③	Order of fuel products

1.2.3.d. BMP4044.OEL(R)/S3+MOD4011.OEL(R)/WSE & BMP4048.OED/S3+MOD4012.OED/WSE



Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	7	Outlet of electrical cables for data transmission
2	Suction piping - TR 44.5 x 2.5	8	Axis of inlet piping for windshield wiper fluid (WSE)
3	Leak catcher tray	9	Inlet piping for WSE with ball valve, G 1" (external thread)
4	Vapor recovery piping TR 32 x 2.5 is terminated by an internal thread G1" (not equipped in dispensers made for dispensing diesel)	10	Breakaway valve OPW 10BF firmly connected to the base (not a part of the standard dispenser supply)
5	Anchoring holes	⇦	Recommended direction of arrival of the vehicles to the dispenser
6	Outlet of electrical cables for dispenser powering	①② ③④	Order of fuel products

APPENDIX 1.2.4. DETAIL OF INLET PIPING CONNECTION

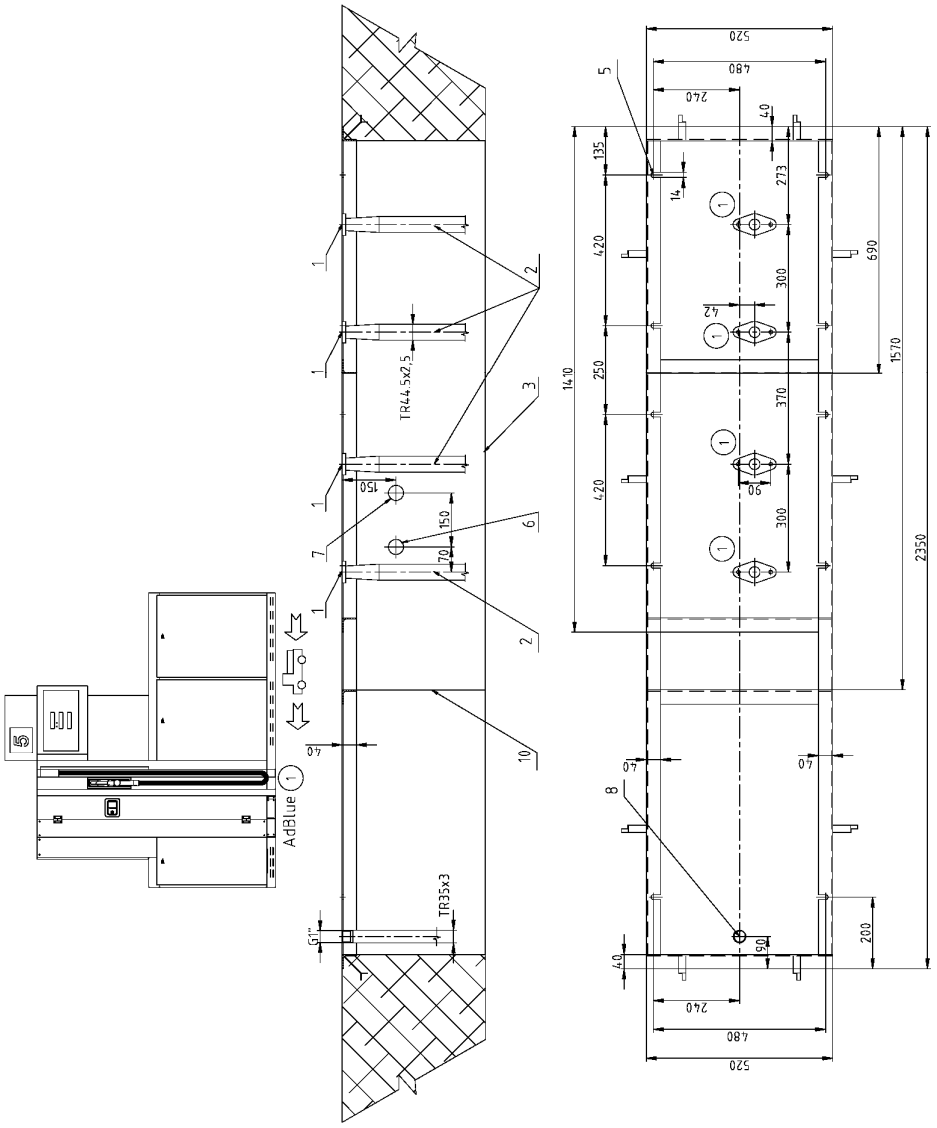


Pos.	Description	Pos.	Description
1	Inlet filter	5	Ball shutoff valve
2	Flange	6	Adapter from G1" to G1 ½"
3	Swivel nut with sealing ring	7	Base frame
4	Connecting pipe enabling height adjustment of the inlet piping in the range of 25mm to 45mm	8	Breakaway valve OPW 10BF firmly connected to the base frame (not part of the regular dispenser supply)

APPENDIX 1.3. FOUNDATION PLANS FOR SPECIAL VERSIONS OF DISPENSERS

APPENDIX 1.3.1. PLANS OF HIGH-PERFORMANCE DIESEL DISPENSERS – SUCTION VERSION

1.3.1a. BMP4021.OEL(R)/UH+MOD4011.OEL(R)/AdB & BMP4042.OED/UH+MOD4012.OED/AdB

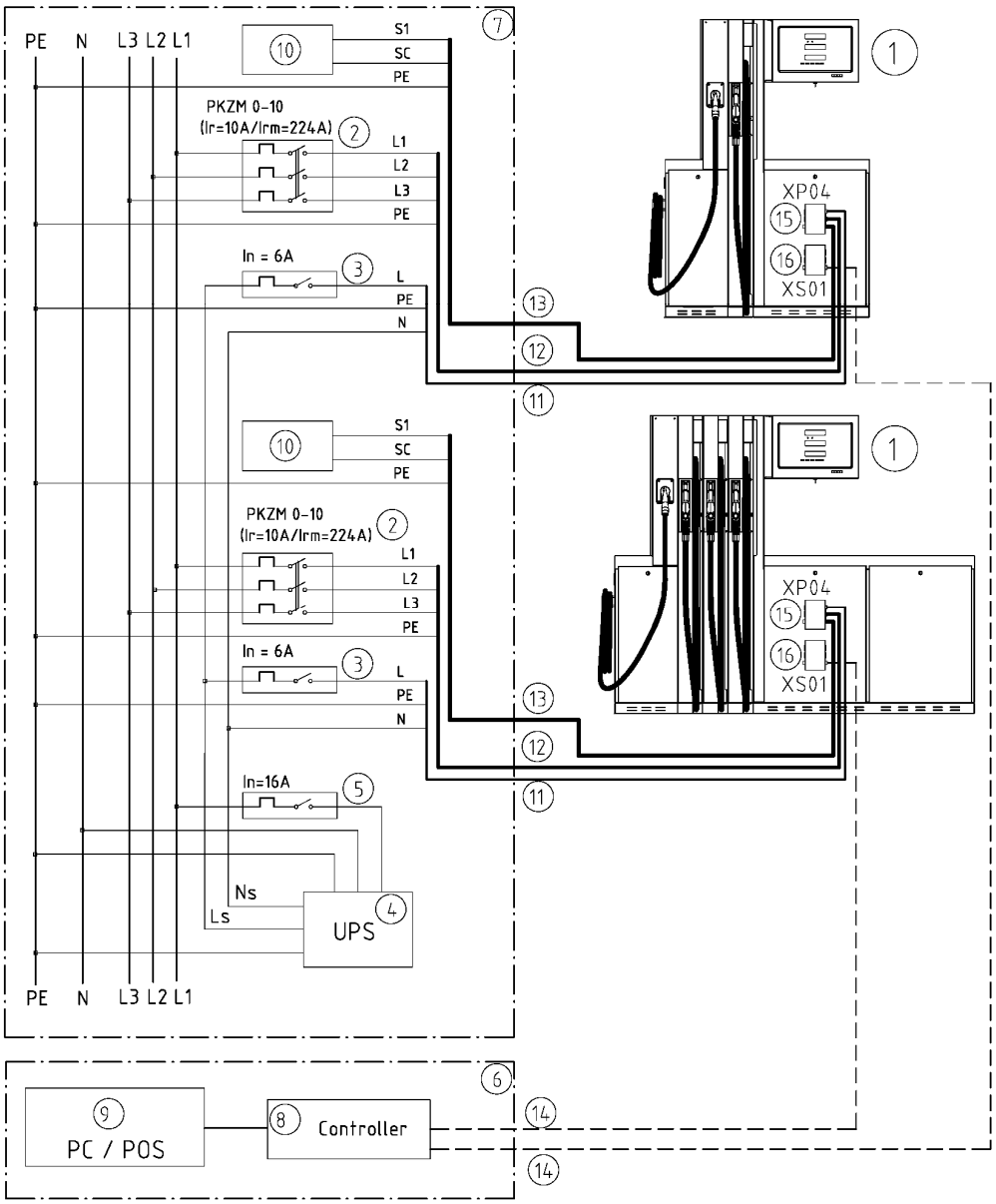


Pos.	Description	Pos.	Description
1	Oval flange PN6 DN32 (G 1¼") according to ČSN EN 13 1365	7	Outlet of electrical cables for data transmission
2	Suction piping - TR 44.5 x 2.5	8	Axis of AdBlue® inlet pressure piping
3	Leak catcher tray	9	AdBlue® inlet pressure piping TR 35 x 3 with external thread G1"
5	Anchoring holes	10	Dividing partition (separating the heated AdBlue® module from the fuel dispenser)
6	Outlet of electrical cables for dispenser powering	⇦	Recommended direction of arrival of the vehicles to the dispenser

APPENDIX 2 – ELECTRICAL WIRING

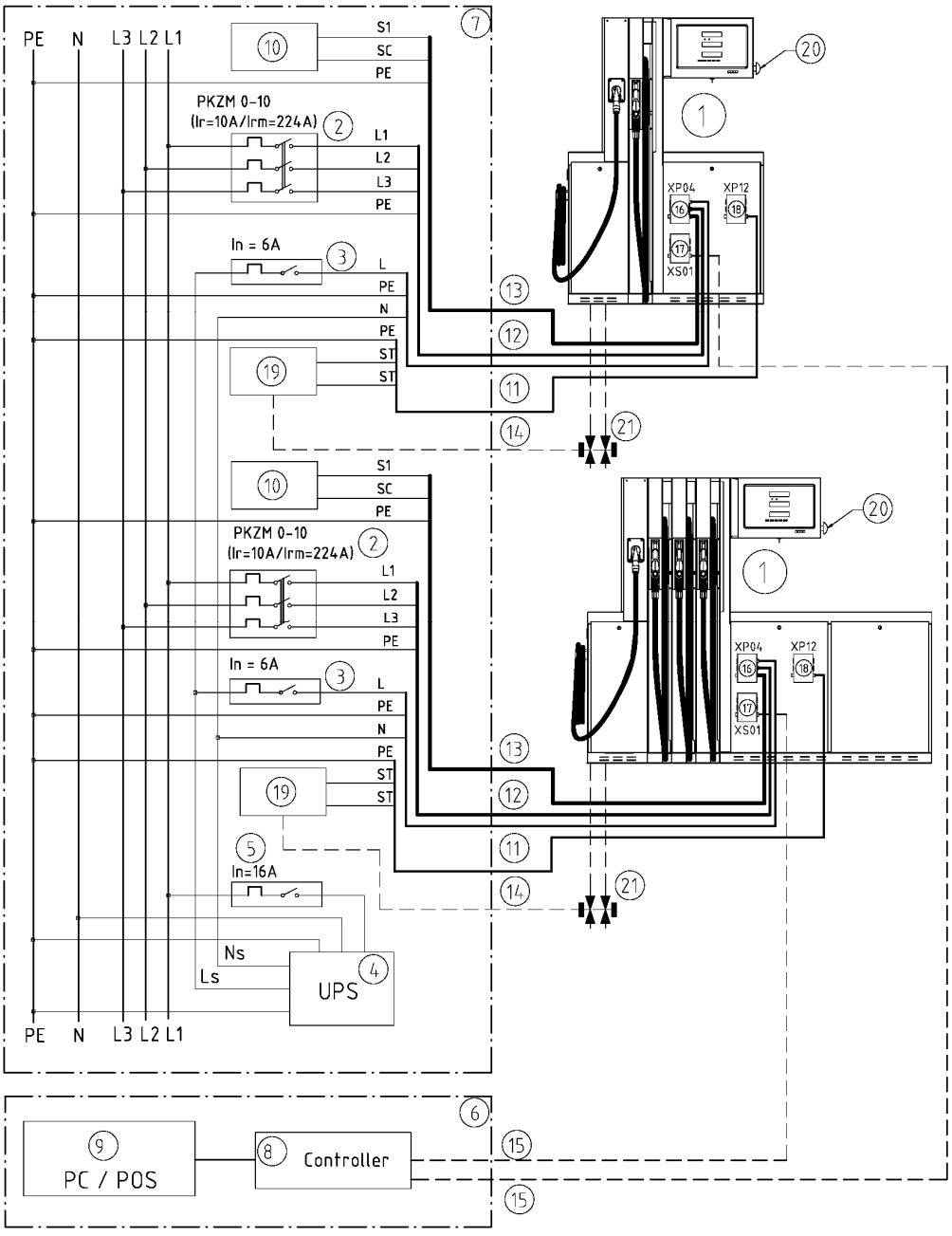
APPENDIX 2.1. – ELECTRICAL WIRING OF COMBI DISPENSERS IN THE SUCTION MODEL

APPENDIX 2.1.1. WIRING OF COMBI DISPENSERS IN SUCTION MODEL WITH LPG MODULE



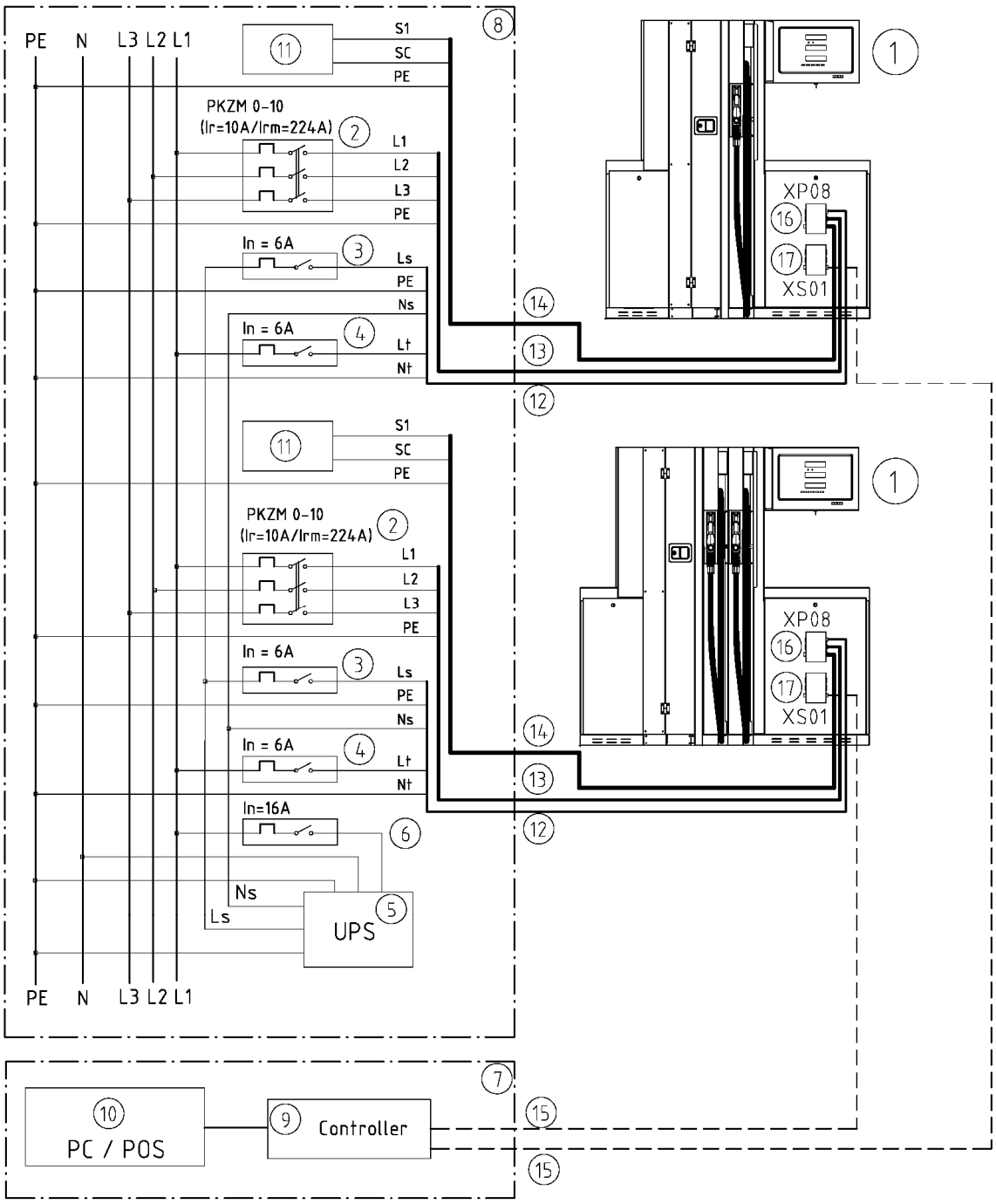
Pos.	Description	Pos.	Description
1	Combined dispenser OCEAN EURO in suction model with LPG module	9	Controlling device (PC, payment terminal, POS, console, …)
2	Motor circuit breaker with short-circuit and thermal trigger	10	Unit for switching the LPG pump
3	Current circuit breaker for counter powering – In=6A	11	Cable for counter powering – H05VV5-F 3x1,5
4	Backup power source UPS with powering stabilization	12	Cable for motor powering – H05VV5-F 4x1,5
5	Current circuit breaker of the UPS	13	Cable for LPG pump switching – H05VV5-F 3x1,5
6	Workplace of the staff (kiosk)	14	Communication line – H05VVC4V5-K 5x0,5
7	Fuel station technology main distribution box	15	Powering distribution box XP10
8	Data converter (RS485 / RS232) or controller	16	Communication distribution box XS01

APPENDIX 2.1.2. WIRING OF COMBI DISPENSERS IN SUCTION MODEL WITH LPG MODULE (VERSION FOR UNATTENDED DELIVERY)



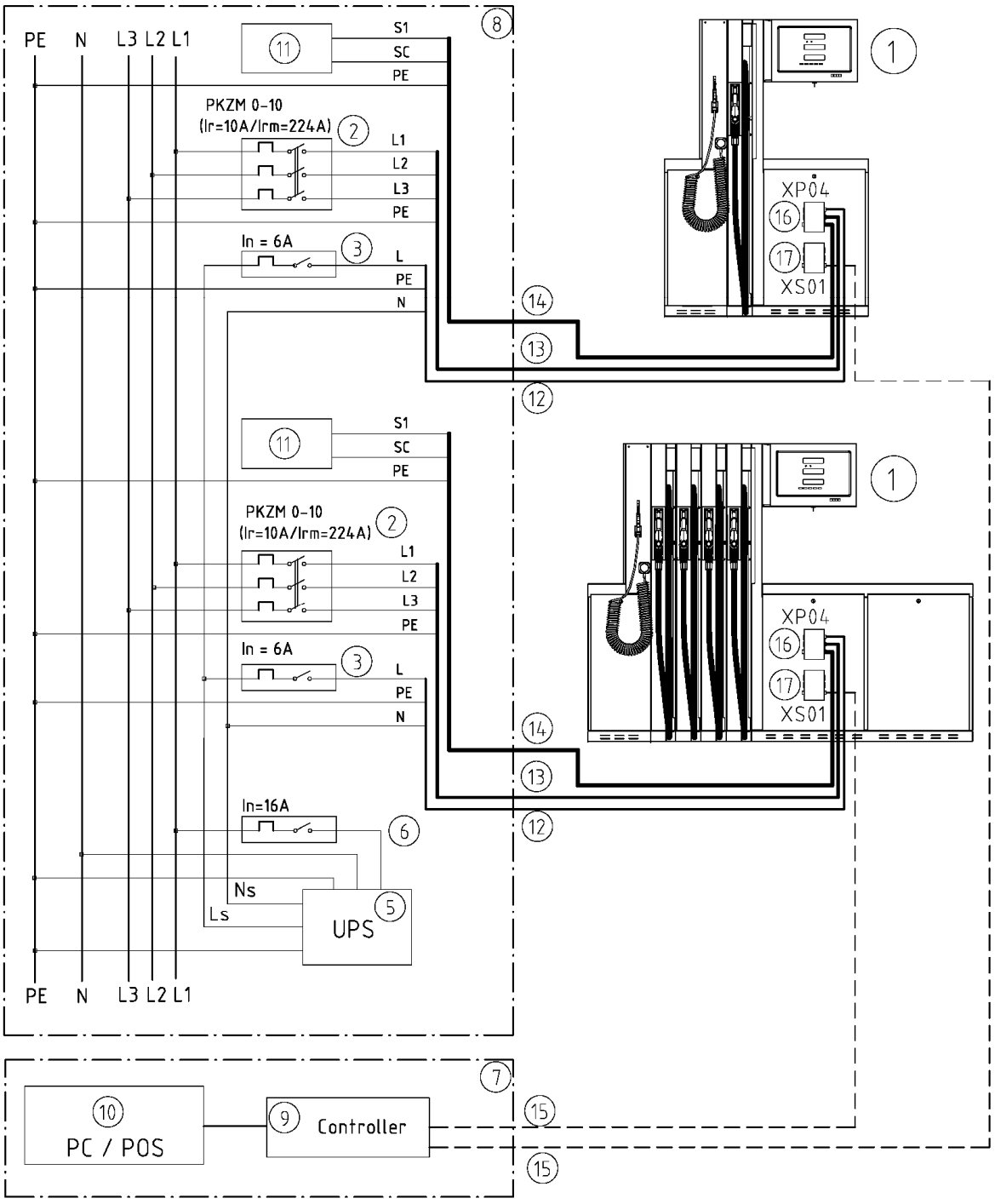
Pos.	Description	Pos.	Description
1	Combined dispenser OCEAN EURO in suction model with LPG module for unattended delivery	12	Cable for motor powering – H05VV5-F 4x1,5
2	Motor circuit breaker with short-circuit and thermal trigger	13	Cable for LPG pump switching – H05VV5-F 3x1,5
3	Current circuit breaker for counter powering – In=6A	14	Cable of the safety STOP button – H05VV5-F 3x1,5
4	Backup power source UPS with powering stabilization	15	Communication line – H05VVC4V5-K 5x0,5
5	Current circuit breaker of the UPS	16	Powering distribution box XP10
6	Workplace of the staff (kiosk)	17	Communication distribution box XS01
7	Fuel station technology main distribution box	18	Distribution box for the signal of the STOP button XP12
8	Data converter (RS485 / RS232) or controller	19	Unit controlling the LPG safety valves
9	Controlling device (PC, payment terminal, POS, console, …)	20	STOP button
10	Unit for switching the LPG pump	21	LPG safety valves at inlet for liquid and gas phase (deactivated after pressing the STOP button or in case of malfunction)
11	Cable for counter powering – H05VV5-F 5x1,5		

APPENDIX 2.1.3. WIRING OF COMBI DISPENSERS IN SUCTION MODEL WITH ADBLUE® MODULE



Pos.	Description	Pos.	Description
1	Combined dispenser OCEAN EURO in suction model with AdBlue® module	9	Data converter (RS485 / RS232) or controller
2	Motor circuit breaker with short-circuit and thermal trigger	10	Controlling device (PC, payment terminal, POS, console, …)
3	Current circuit breaker for counter powering – In=6A	11	Unit for switching the AdBlue® pump
4	Current circuit breaker for AdBlue® module heater powering – In=6A	12	Cable for counter powering and heating – H05VV5-F 5x1,5
		13	Cable for powering of pump motors – H05VV5-F 4x1,5
5	Backup power source UPS with powering stabilization	14	Cable for AdBlue® pump switching – H05VV5-F 3x1,5
6	Current circuit breaker of the UPS	15	Communication line – H05VVC4V5-K 5x0,5
7	Workplace of the staff (kiosk)	16	Powering distribution box XP08
8	Fuel station technology main distribution box	17	Communication distribution box XS01

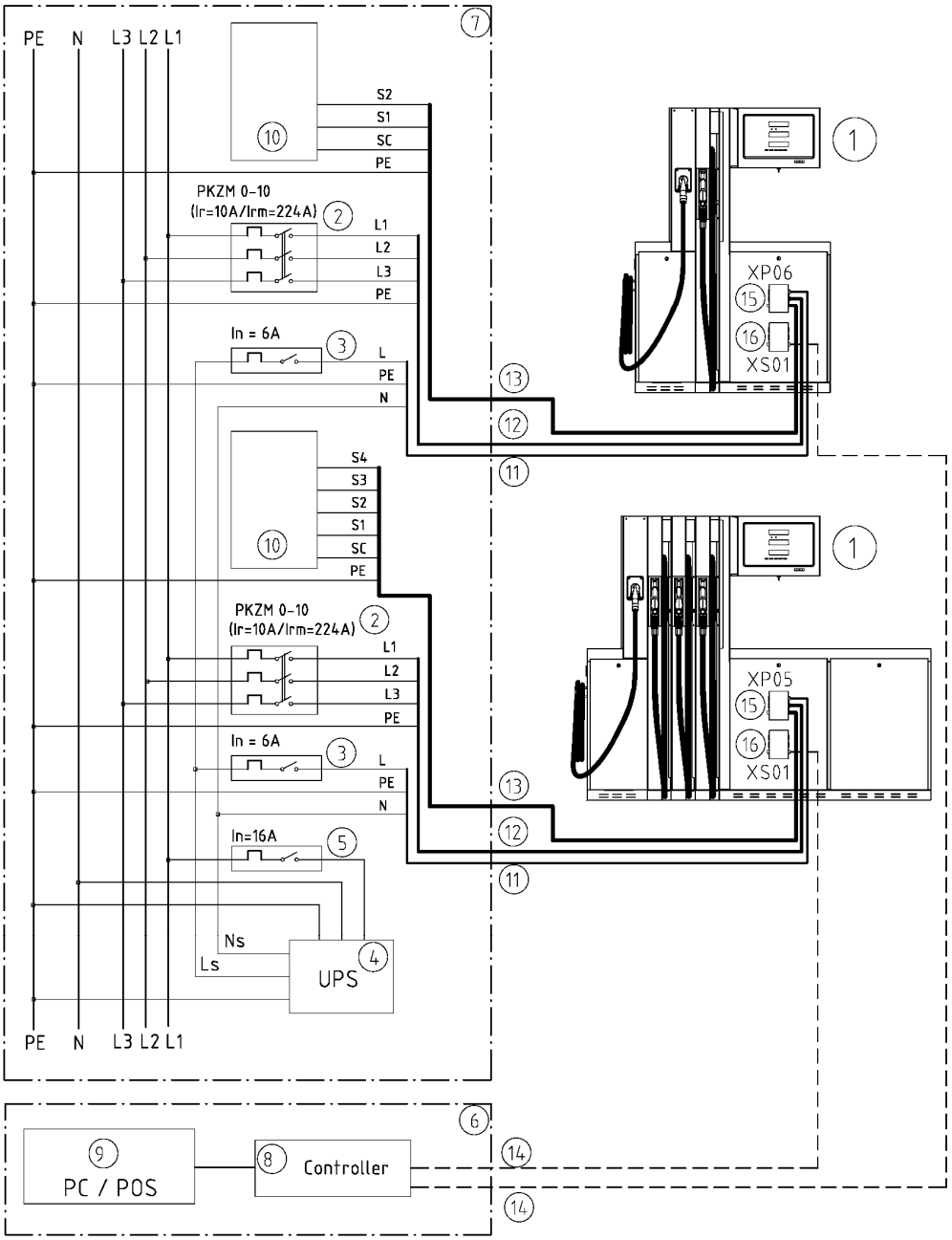
APPENDIX 2.1.4. WIRING OF COMBI DISPENSERS IN SUCTION MODEL WITH WSE MODULE



Pos.	Description	Pos.	Description
1	Combined dispenser OCEAN EURO in suction model with WSE module	10	Controlling device (PC, payment terminal, POS, console, …)
2	Motor circuit breaker with short-circuit and thermal trigger	11	Unit for switching the WSE pump
3	Current circuit breaker for counter powering – In=6A	12	Cable for counter powering – H05VV5-F 3x1,5
5	Backup power source UPS with powering stabilization	13	Cable for pump motor powering – H05VV5-F 4x1,5
6	Current circuit breaker of the UPS	14	Cable for WSE pump switching – H05VV5-F 3x1,5
7	Workplace of the staff (kiosk)	15	Communication line – H05VVC4V5-K 5x0,5
8	Fuel station technology main distribution box	16	Powering distribution box XP04
9	Data converter (RS485 / RS232) or controller	17	Communication distribution box XS01

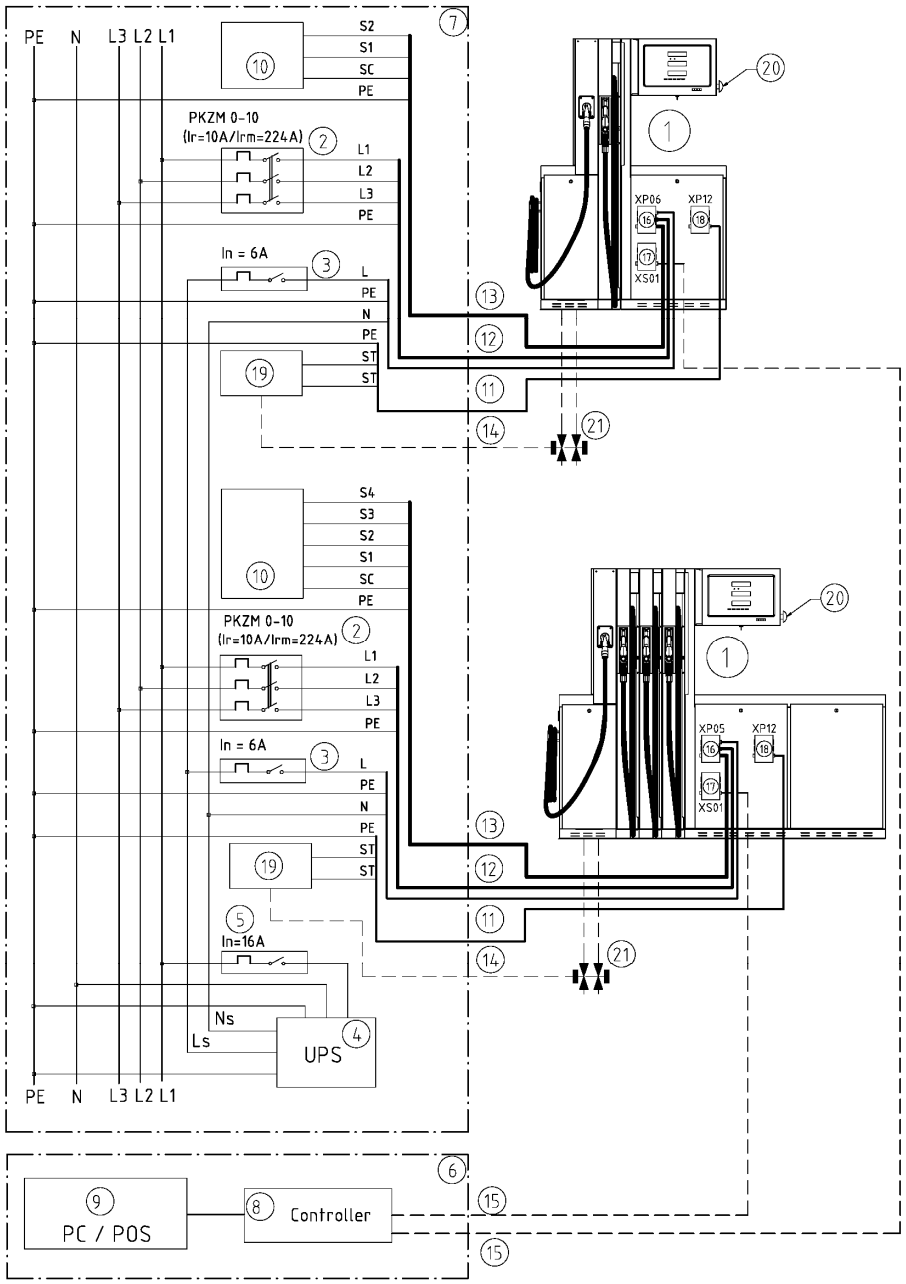
APPENDIX 2.2. – ELECTRICAL WIRING OF COMBI DISPENSERS IN PRESSURE MODEL

APPENDIX 2.2.1. WIRING OF COMBI DISPENSERS IN PRESSURE MODEL WITH LPG MODULE



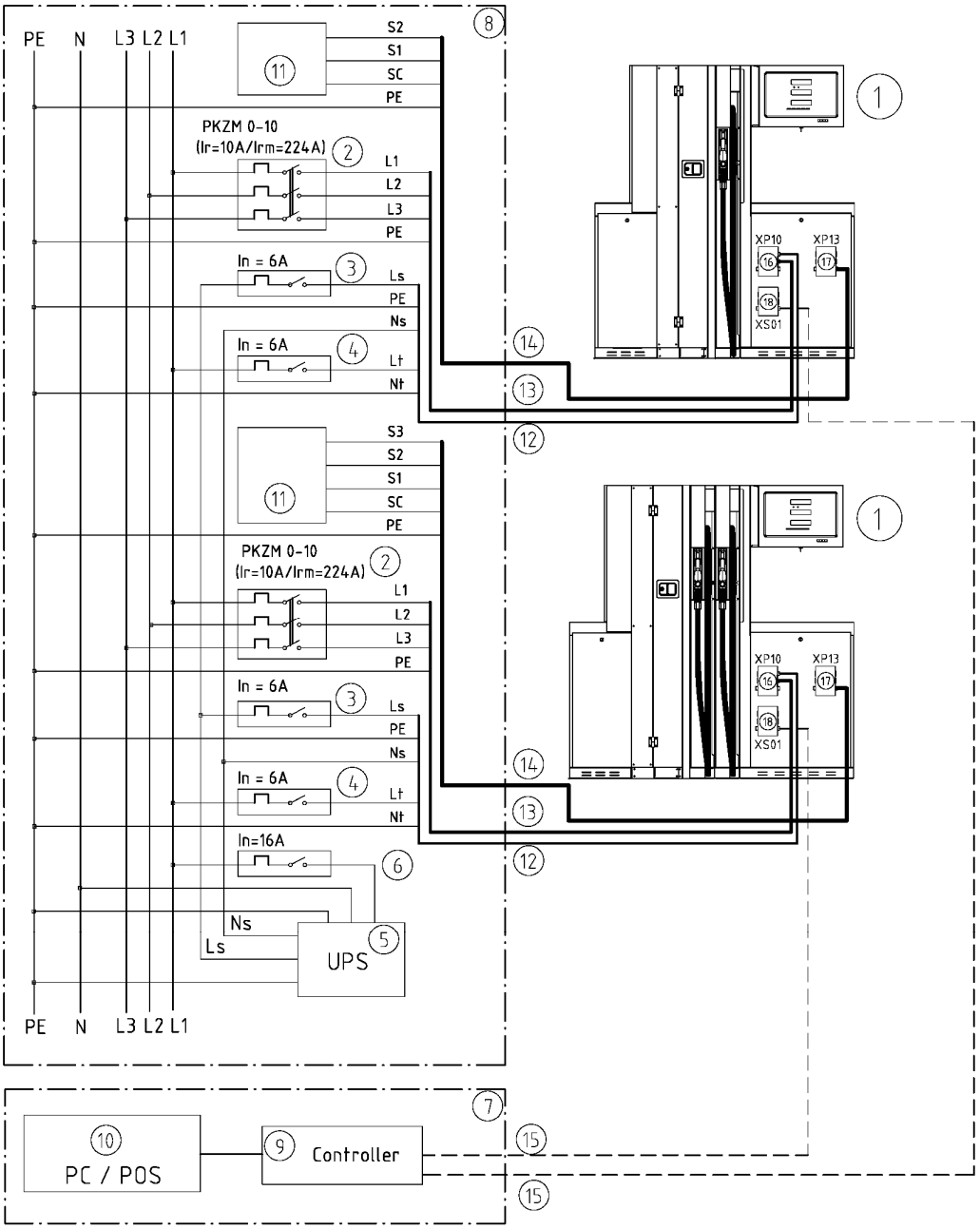
Pos.	Description	Pos.	Description
1	Combined dispenser OCEAN EURO in suction model with LPG module	9	Controlling device (PC, payment terminal, POS, console, …)
2	Motor circuit breaker with short-circuit and thermal trigger	10	Unit for switching the WSE pump
3	Current circuit breaker for counter powering – In=6A	11	Cable for counter powering – H05VV5-F 3x1,5
4	Backup power source UPS with powering stabilization	12	Cable for pump motor powering – H05VV5-F 4x1,5
5	Current circuit breaker of the UPS	13	Cable for fuel and LPG pump switching – H05VV5-F 7x1,0
6	Workplace of the staff (kiosk)	14	Communication line – H05VVC4V5-K 5x0,5
7	Fuel station technology main distribution box	15	Powering distribution box XP06 (1 product + LPG), XP07 (2 products + LPG), XP05 (3 products + LPG), XP11 (4 products + LPG)
8	Data converter (RS485 / RS232) or controller	16	Communication distribution box XS01

APPENDIX 2.2.2. WIRING OF COMBI DISPENSERS IN PRESSURE MODEL WITH LPG MODULE (VERSION FOR UNATTENDED DELIVERY)



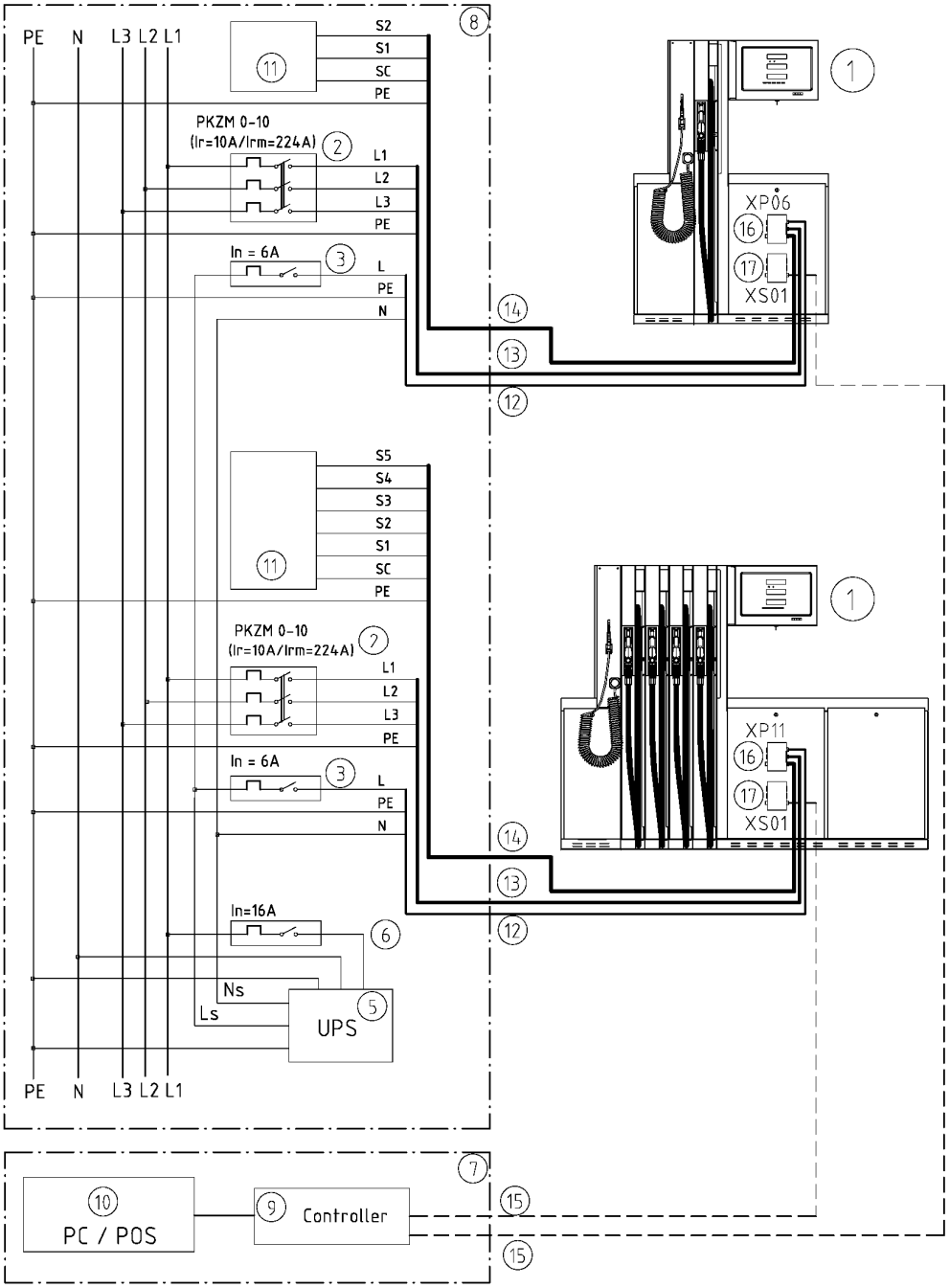
Pos.	Description	Pos.	Description
1	Combined dispenser OCEAN EURO in suction model with LPG module for unattended delivery	12	Cable for suction pump motor powering – H05VV5-F 4x1,5
2	Motor circuit breaker with short-circuit and thermal trigger	13	Cable for fuel and LPG pump switching – H05VV5-F 7x1,0
3	Current circuit breaker for counter powering – In=6A	14	Cable of the safety STOP button – H05VV5-F 3x1,5
4	Backup power source UPS with powering stabilization	15	Communication line – H05VVC4V5-K 5x0,5
5	Current circuit breaker of the UPS	16	Powering distribution box – XP06 (1 product + LPG), XP07 (2 products + LPG), XP05 (3 products + LPG), XP11 (4 products + LPG)
6	Workplace of the staff (kiosk)	17	Communication distribution box – XS01
7	Fuel station technology main distribution box	18	Distribution box for STOP button signal – XP12
8	Data converter (RS485 / RS232) or controller	19	Unit controlling the LPG safety valves
9	Controlling device (PC, payment terminal, POS, console, …)	20	STOP button
10	Unit for switching the fuel pumps and LPG pump	21	LPG safety valves at inlet for liquid and gas phase (deactivated after pressing the STOP button or in case of malfunction)
11	Cable for counter powering – H05VV5-F 5x1,5		

APPENDIX 2.2.3. WIRING OF COMBI DISPENSERS IN PRESSURE MODEL WITH ADBLUE® MODULE



Pos.	Description	Pos.	Description
1	Combined dispenser OCEAN EURO with AdBlue® module	10	Controlling device (PC, payment terminal, POS, console, …)
2	Motor circuit breaker with short-circuit and thermal trigger	11	Unit for switching the fuel pumps and AdBlue® pump
3	Current circuit breaker for counter powering – In=6A	12	Cable for counter and heater powering – H05VV5-F 5x1,5
4	Current circuit breaker for AdBlue® module heater powering – In=6A	13	Cable for suction pump motor powering – H05VV5-F 4x1,5
5	Backup power source UPS with powering stabilization	14	Cable for fuel and AdBlue® pump switching – H05VV5-F 7x1,0
6	Current circuit breaker of the UPS	15	Communication line – H05VVC4V5-K 5x0,5
7	Workplace of the staff (kiosk)	16	Powering distribution box XP10
8	Fuel station technology main distribution box	17	Distribution box for pump switching XP13
9	Data converter (RS485 / RS232) or controller	18	Communication distribution box XS01

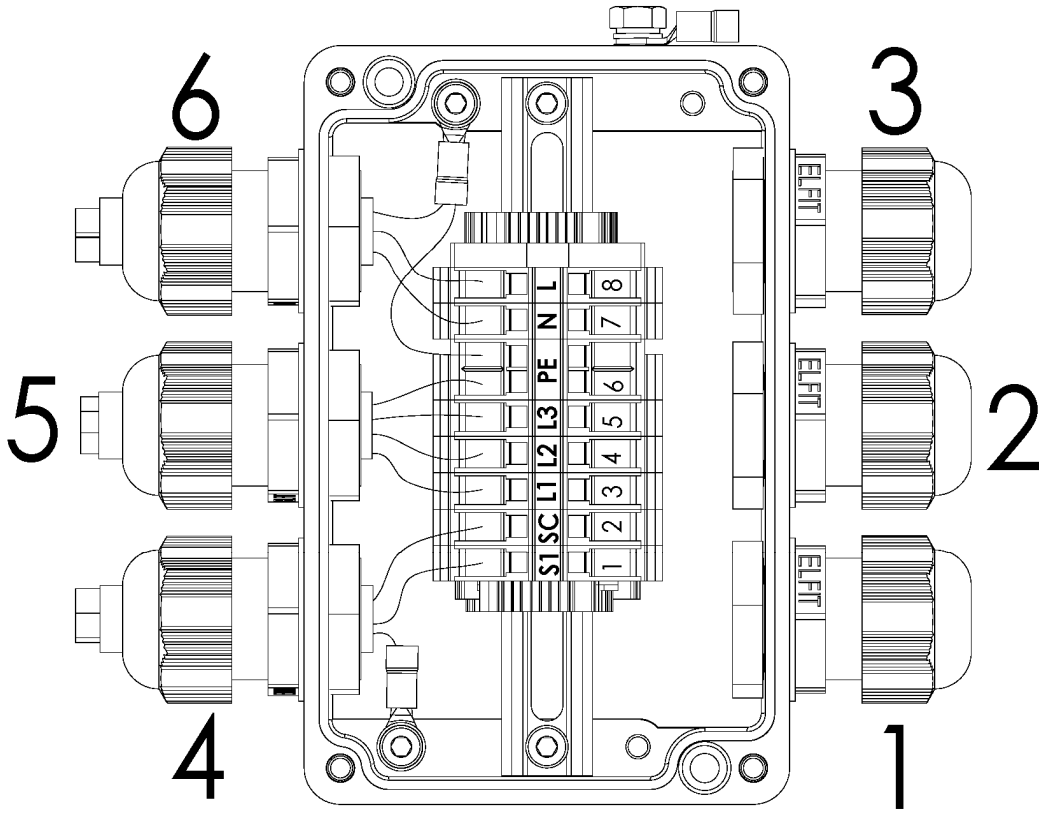
APPENDIX 2.2.4. WIRING OF COMBI DISPENSERS IN PRESSURE MODEL WITH WSE MODULE



Pos.	Description	Pos.	Description
1	Combined dispenser OCEAN EURO with WSE module	10	Controlling device (PC, payment terminal, POS, console, …)
2	Motor circuit breaker with short-circuit and thermal trigger	11	Unit for switching the fuel pumps and WSE pump
3	Current circuit breaker for counter powering – In=6A	12	Cable for counter powering – H05VV5-F 3x1,5
5	Backup power source UPS with powering stabilization	13	Cable for vacuum pump motor powering – H05VV5-F 4x1,5
6	Current circuit breaker of the UPS	14	Cable for fuel and WSE pump switching – H05VV5-F 7x1,5
7	Workplace of the staff (kiosk)	15	Communication line – H05VVC4V5-K 5x0,5
8	Fuel station technology main distribution box	16	Powering distribution box XP06 (1 product + WSE), XP07 (2 products + WSE), XP05 (3 products + WSE), XP11 (4 products + WSE)
9	Data converter (RS485 / RS232) or controller	17	Communication distribution box XS01

APPENDIX 2.3. – ELECTRIC WIRING OF DISTRIBUTION BOXES

APPENDIX 2.3.1. WIRING OF POWERING BOX XP04 (LPG/WSE)



Output

6	**Powering cable for dispenser electronic counter** Type: H05VV5-F 3x1.5 Wiring: XP04 ---> dispenser counter box	
L	phase	black
N	neutral conduit	blue
PE loop M4	protective conduit	green-yellow

5	**Powering cable for pump and vacuum pump motors** Type: H05VV5-F 4x1.5 Wiring: XP04 ---> dispenser counter box	
L3	phase 3	black 3
L2	phase 2	black 2
L1	phase 1	black 1
PE	protective conduit	green-yellow

4	**Powering cable for LPG/WSE pump switching** Type: H05VV5-F 3x1.5 Wiring: XP04 <---> dispenser counter box	
SC	shared conduit	black 2
S1	switched phase (LPG/WSE)	black 1
PE loop M4	protective conduit	green-yellow

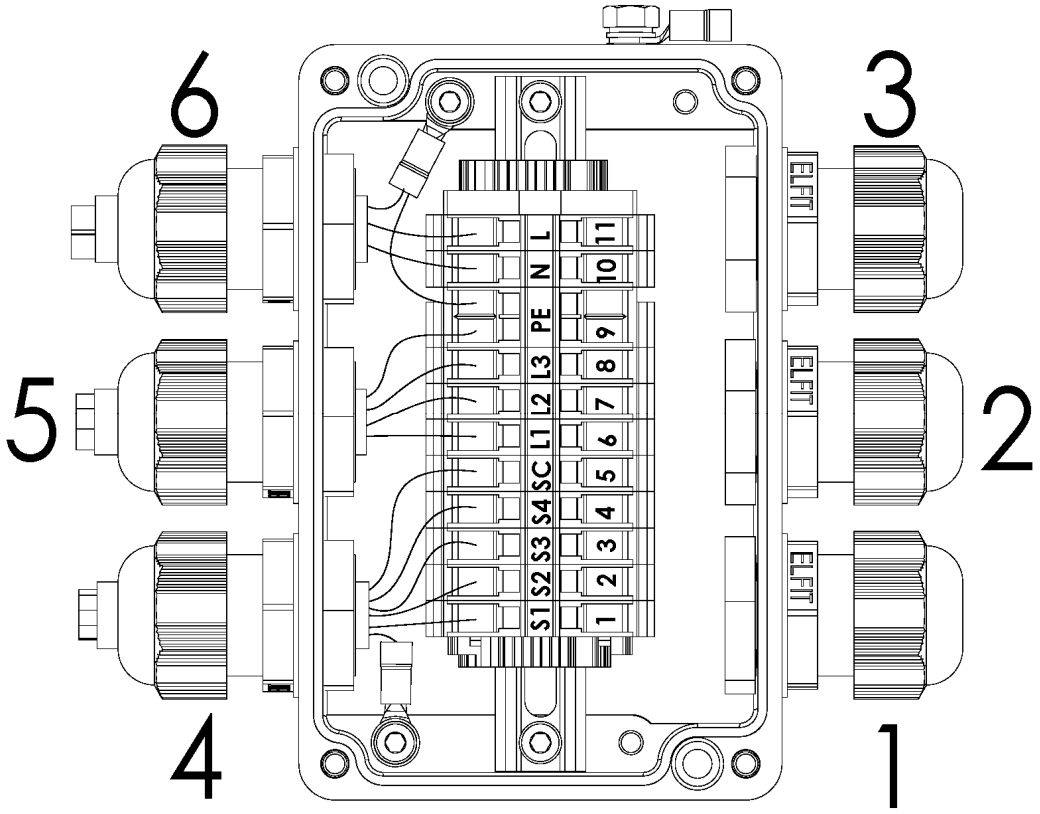
Input

3	**Powering cable for dispenser electronic counter** Type: H05VV5-F 3x1.5 Wiring: XP04 <---> station distribution box	
8	phase	black
7	neutral conduit	blue
6	protective conduit	green-yellow

2	**Powering cable for pump and vacuum pump motors** Type: H05VV5-F 4x1.5 Wiring: XP04 <---> station distribution box	
5	phase 3	black 3
4	phase 2	black 2
3	phase 1	black 1
6	protective conduit	green-yellow

1	**Cable for LPG/WSE pump switching** Type: H05VV5-F 3x1.5 Wiring: XP04 <---> station distribution box	
2	shared conduit	black 2
1	switched phase (LPG/WSE)	black 1
PE loop M4	protective conduit	green-yellow

APPENDIX 2.3.2. WIRING OF POWERING BOX XP05 (LPG/WSE)



Output

6	**Powering cable for dispenser electronic counter** Type: H05VV5-F 3x1.5 Wiring: XP05 ---> dispenser counter box	
L	phase	black
N	neutral conduit	blue
PE loop M4	protective conduit	green-yellow

5	**Powering cable for vacuum pump motors** Type: H05VV5-F 4x1.5 Wiring: XP05 ---> dispenser counter box	
L3	phase 3	black 3
L2	phase 2	black 2
L1	phase 1	black 1
PE	protective conduit	green-yellow

4	**Cable for switching of fuel and LPG/WSE pumps** Type: H05VV5-F 7x1.0 Wiring: XP05 <---> dispenser counter box	
SC	shared conduit	black 5
S4	switched phase 4 (LPG/WSE)	black 4
S3	switched phase 3	black 3
S2	switched phase 2	black 2
S1	switched phase 1	black 1
PE loop M4	protective conduit	green-yellow

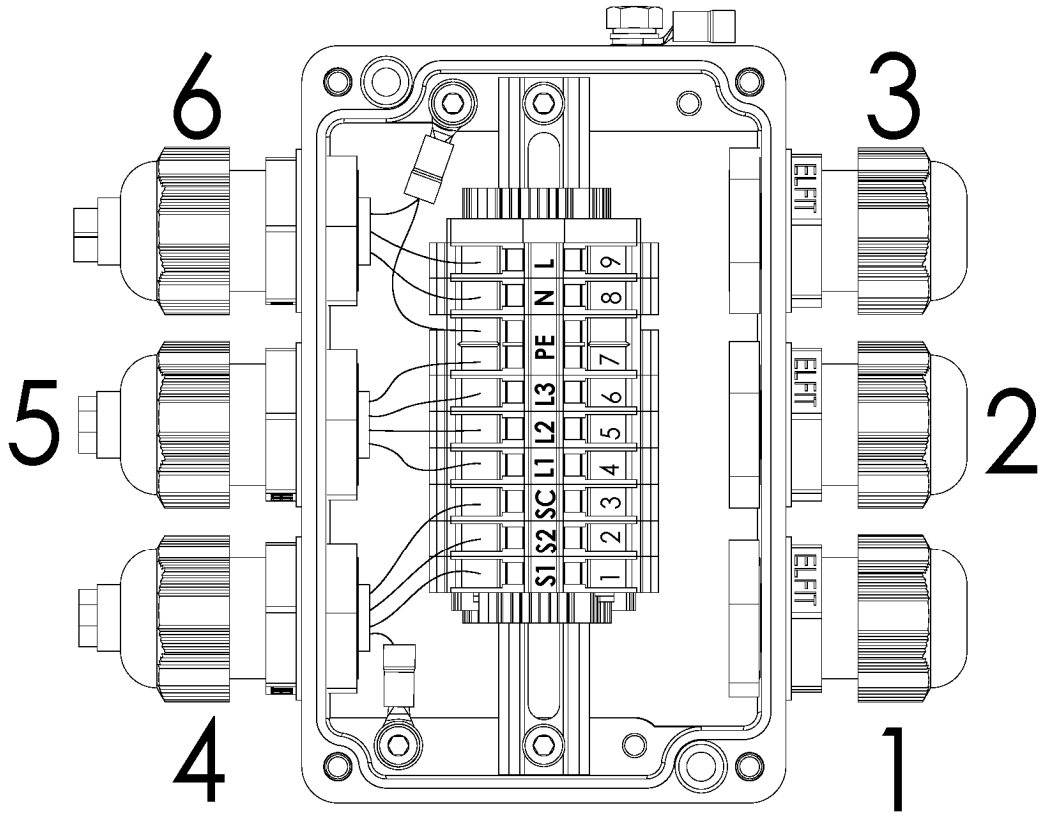
Input

3	**Powering cable for dispenser electronic counter** Type: H05VV5-F 3x1.5 Wiring: XP05 <---> station distribution box	
11	phase	black
10	neutral conduit	blue
9	protective conduit	green-yellow

2	**Powering cable for vacuum pump motors** Type: H05VV5-F 4x1.5 Wiring: XP05 <---> station distribution box	
8	phase 3	black 3
7	phase 2	black 2
6	phase 1	black 1
9	protective conduit	green-yellow

1	**Cable for switching of fuel and LPG/WSE pumps** Type: H05VV5-F 7x1.0 Wiring: XP05 <---> station distribution box	
5	shared conduit	black 5
4	switched phase 4 (LPG/WSE)	black 4
3	switched phase 3	black 3
2	switched phase 2	black 2
1	switched phase 1	black 1
PE loop M4	protective conduit	green-yellow

APPENDIX 2.3.3. WIRING OF POWERING BOX XP06 LPG/WSE)



Output

6	**Powering cable for dispenser electronic counter** Type: H05VV5-F 3x1.5 Wiring: XP06 ---> dispenser counter box	
L	phase	black
N	neutral conduit	blue
PE loop M4	protective conduit	green-yellow

5	**Powering cable for suction pump motors** Type: H05VV5-F 4x1.5 Wiring: XP06 ---> dispenser counter box	
L3	phase 3	black 3
L2	phase 2	black 2
L1	phase 1	black 1
PE	protective conduit	green-yellow

4	**Cable for switching of fuel and LPG/WSE pumps** Type: H05VV5-F 4x1.5 Wiring: XP06 <---> dispenser counter box	
SC	shared conduit	black 3
S2	switched phase 2 (LPG/WSE)	black 2
S1	switched phase 1	black 1
PE loop M4	protective conduit	green-yellow

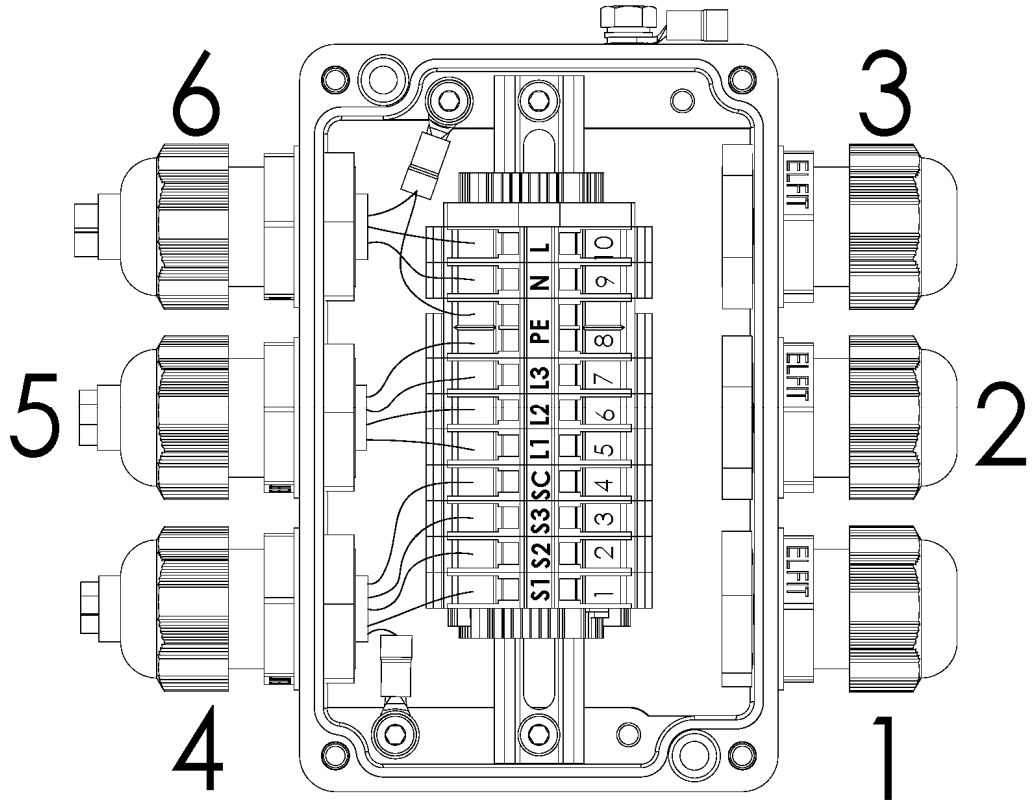
Input

3	**Powering cable for dispenser electronic counter** Type: H05VV5-F 3x1.5 Wiring: XP06 <---> station distribution box	
9	phase	black
8	neutral conduit	blue
7	protective conduit	green-yellow

2	**Powering cable for suction pump motors** Type: H05VV5-F 4x1.5 Wiring: XP06 <---> station distribution box	
6	phase 3	black 3
5	phase 2	black 2
4	phase 1	black 1
7	protective conduit	green-yellow

1	**Cable for switching of fuel and LPG/WSE pumps** Type: H05VV5-F 7x1.0 (recommended) Wiring: XP06 <---> station distribution box	
3	shared conduit	black 3
2	switched phase 2 (LPG/WSE)	black 2
1	switched phase 1	black 1
PE loop M4	protective conduit	green-yellow

APPENDIX 2.3.4. WIRING OF POWERING BOX XP07 (LPG/WSE)



Output

6	**Powering cable for dispenser electronic counter** Type: H05VV5-F 3x1.5 Wiring: XP07 ---> dispenser counter box	
L	phase	black
N	neutral conduit	blue
PE loop M4	protective conduit	green-yellow

5	**Powering cable for vacuum pump motors** Type: H05VV5-F 4x1.5 Wiring: XP07 ---> dispenser counter box	
L3	phase 3	black 3
L2	phase 2	black 2
L1	phase 1	black 1
PE	protective conduit	green-yellow

4	**Cable for switching of fuel and LPG/WSE pumps** Type: H05VV5-F 5x1.5 Wiring: XP07 <---> dispenser counter box	
SC	shared conduit	black 4
S3	switched phase 3 (LPG/WSE)	black 3
S2	switched phase 2	black 2
S1	switched phase 1	black 1
PE loop M4	protective conduit	green-yellow

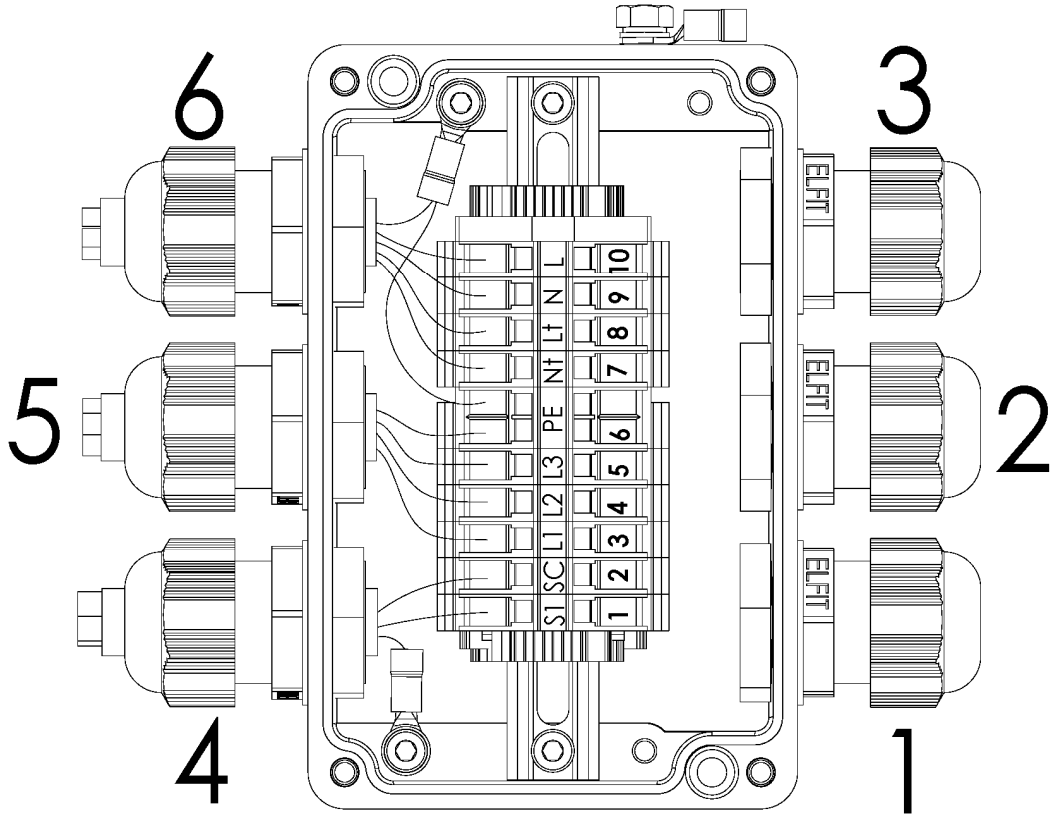
Input

3	**Powering cable for dispenser electronic counter** Type: H05VV5-F 3x1.5 Wiring: XP07 <---> station distribution box	
10	phase	black
9	neutral conduit	blue
8	protective conduit	green-yellow

2	**Powering cable for vacuum pump motors** Type: H05VV5-F 4x1.5 Wiring: XP07 <---> station distribution box	
7	phase 3	black 3
6	phase 2	black 2
5	phase 1	black 1
8	protective conduit	green-yellow

1	**Cable for switching of fuel and LPG/WSE pumps** Type: H05VV5-F 7x1.0 (recommended) Wiring: XP07 <---> station distribution box	
4	shared conduit	black 4
3	switched phase 3 (LPG/WSE)	black 3
2	switched phase 2	black 2
1	switched phase 1	black 1
PE loop M4	protective conduit	green-yellow

APPENDIX 2.3.5. WIRING OF POWERING BOX XP08 (ADBLUE®)



Output

6	**Powering cable for electronic counter and heating** Type: H05VV5-F 5x1.5 Wiring: XP08 ---> dispenser counter box	
Ls	phase	black
Ns	neutral conduit	blue
Lt	phase of AdB module heating	brown
Nt	neutral conduit for heating	blue
PE loop M4	protective conduit	green-yellow

5	**Powering cable for pump and vacuum pump motors** Type: H05VV5-F 4x1.5 Wiring: XP08 ---> dispenser counter box	
L3	phase 3	black 3
L2	phase 2	black 2
L1	phase 1	black 1
PE	protective conduit	green-yellow

4	**Powering cable for switching of LPG/WSE pump** Type: H05VV5-F 3x1.5 Wiring: XP08 <---> dispenser counter box	
SC	shared conduit	black 2
S1	switched phase (AdB)	black 1
PE loop M4	protective conduit	green-yellow

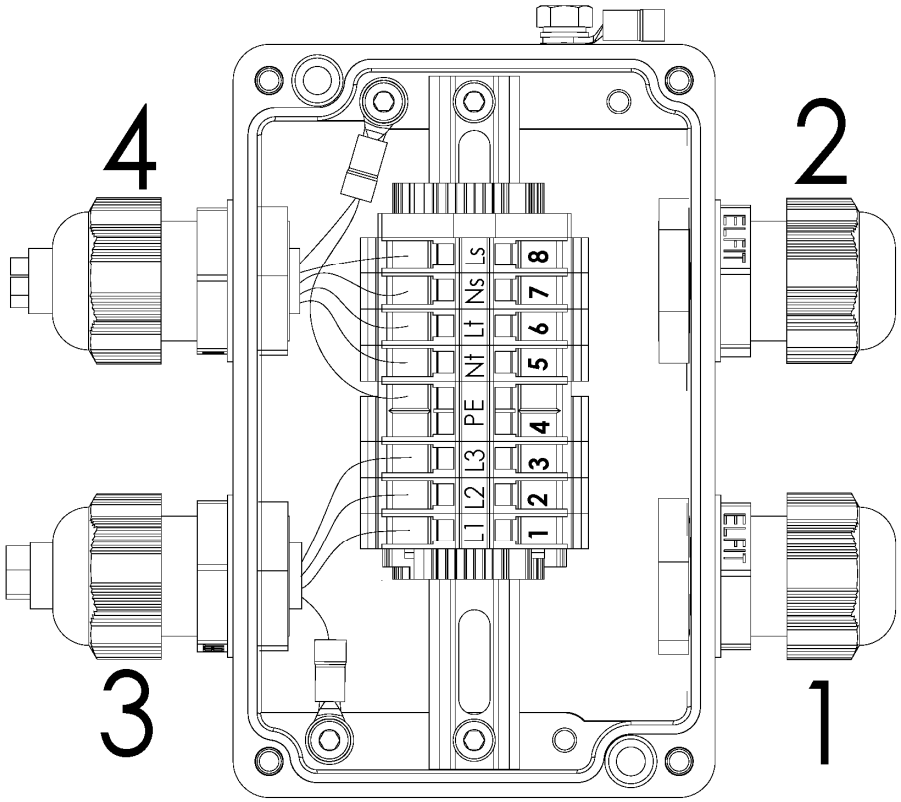
Input

3	**Powering cable for electronic counter and heating** Type: H05VV5-F 5x1.5 Wiring: XP08 <---> station distribution box	
10	phase	black
9	neutral conduit	blue
8	phase of AdB module heating	brown
7	neutral conduit for heating	blue
6	protective conduit	green-yellow

2	**Powering cable for pump and vacuum pump motors** Type: H05VV5-F 4x1.5 Wiring: XP08 <---> station distribution box	
5	phase 3	black 3
4	phase 2	black 2
3	phase 1	black 1
6	protective conduit	green-yellow

1	**Cable for switching of LPG/WSE pump** Type: H05VV5-F 3x1.5 Wiring: XP08 <---> station distribution box	
2	shared conduit	black 2
1	switched phase (AdB)	black 1
PE loop M4	protective conduit	green-yellow

APPENDIX 2.3.6. WIRING OF POWERING BOX XP10 (ADBLUE®)



Output

4	**Powering cable for electronic counter and heating** Type: H05VV5-F 5x1.5 Wiring: XP10 ---> dispenser counter box	
Ls	phase	black
Ns	neutral conduit	blue
Lt	phase of AdB module heating	brown
Nt	neutral conduit heating	blue
PE loop M4	protective conduit	green-yellow

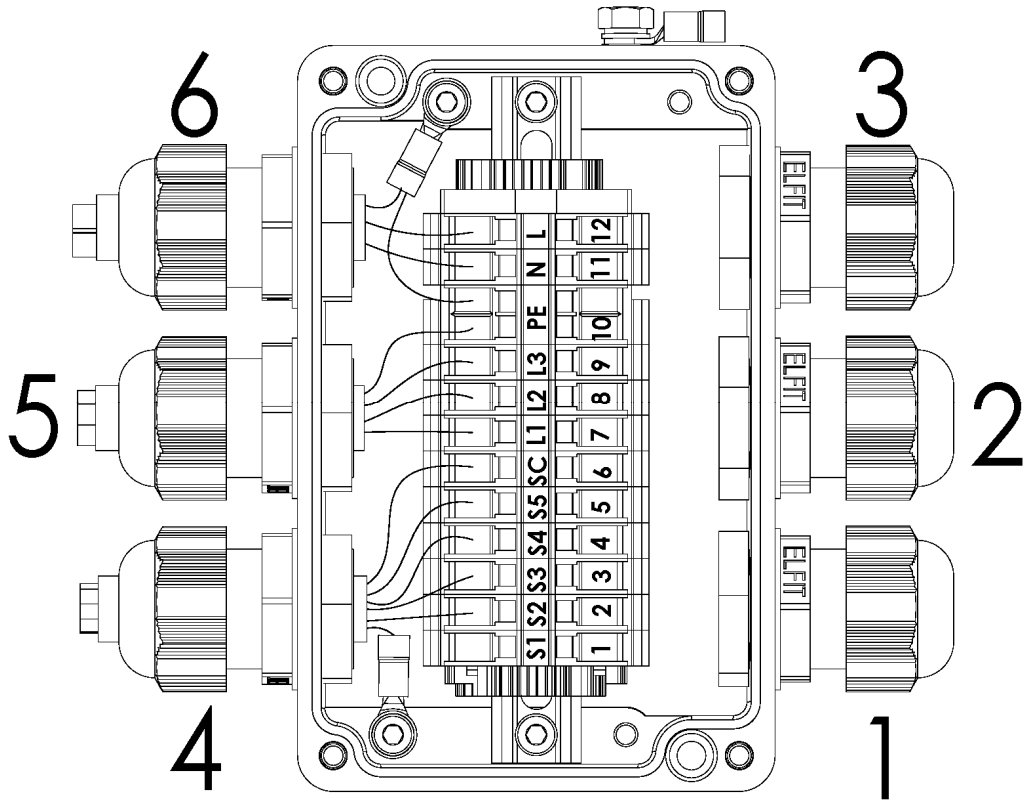
3	**Powering cable for vacuum pump motors** Type: H05VV5-F 4x1.5 Wiring: XP10 ---> dispenser counter box	
PE loop M4	protective conduit	green-yellow
L3	phase 3	black 3
L2	phase 2	black 2
L1	phase 1	black 1

Input

2	**Powering cable for electronic counter and heating** Type: H05VV5-F 5x1.5 Wiring: XP10 <---> station distribution box	
8	phase	black
7	neutral conduit	blue
6	phase of AdB module heating	brown
5	neutral conduit heating	blue
4	protective conduit	green-yellow

1	**Powering cable for vacuum pump motors** Type: H05VV5-F 4x1.5 Wiring: XP10 <---> station distribution box	
4	protective conduit	green-yellow
3	phase 3	black 3
2	phase 2	black 2
1	phase 1	black 1

APPENDIX 2.3.7. WIRING OF POWERING BOX XP11 (LPG/WSE)



Output

6	**Powering cable for dispenser electronic counter** Type: H05VV5-F 3x1.5 Wiring: XP11 ---> dispenser counter box	
L	phase	black
N	neutral conduit	blue
PE loop M4	protective conduit	green-yellow

5	**Powering cable for vacuum pump motors** Type: H05VV5-F 4x1.5 Wiring: XP11 ---> dispenser counter box	
L3	phase 3	black 3
L2	phase 2	black 2
L1	phase 1	black 1
PE	protective conduit	green-yellow

4	**Cable for switching of fuel and LPG/WSE pumps** Type: H05VV5-F 7x1.0 Wiring: XP11 <---> dispenser counter box	
SC	shared conduit	black 6
S5	switched phase 5 (LPG/WSE)	black 5
S4	switched phase 4	black 4
S3	switched phase 3	black 3
S2	switched phase 2	black 2
S1	switched phase 1	black 1
PE loop M4	protective conduit	green-yellow

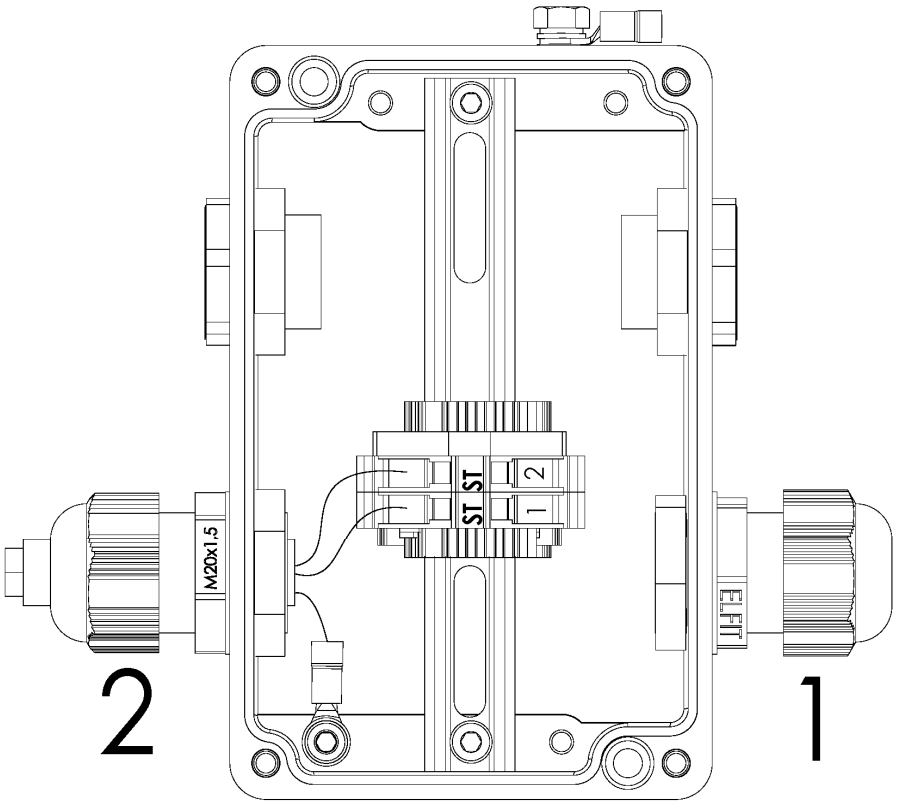
Input

3	**Powering cable for dispenser electronic counter** Type: H05VV5-F 3x1.5 Wiring: XP11 <---> station distribution box	
12	phase	black
11	neutral conduit	blue
10	protective conduit	green-yellow

2	**Powering cable for vacuum pump motors** Type: H05VV5-F 4x1.5 Wiring: XP11 <---> station distribution box	
9	phase 3	black 3
8	phase 2	black 2
7	phase 1	black 1
10	protective conduit	green-yellow

1	**Cable for switching of fuel and LPG/WSE pumps** Type: H05VV5-F 7x1.0 Wiring: XP11 <---> station distribution box	
6	shared conduit	black 6
5	switched phase 5 (LPG/WSE)	black 5
4	switched phase 4	black 4
3	switched phase 3	black 3
2	switched phase 2	black 2
1	switched phase 1	black 1
PE loop M4	protective conduit	green-yellow

APPENDIX 2.3.8. WIRING OF XP12 BOX (LPG STOP BUTTON)



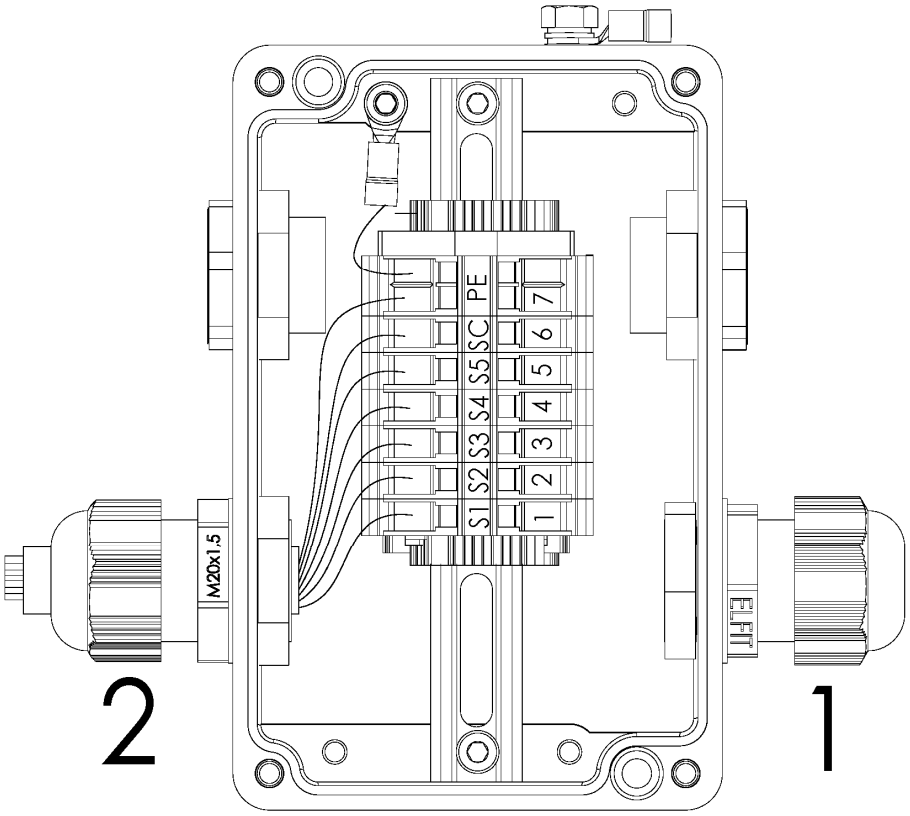
Output

2	**Cable for STOP button signal** Type: H05VV5-F 3x1.5 Wiring: XP12 ---> dispenser counter box	
ST	STOP signal	black 2
ST	STOP signal	black 1
PE loop M4	protective conduit	green-yellow

Input

1	**Cable for STOP button signal** Type: H05VV5-F 3x1.5 Wiring: XP12 <---> station distribution box	
2	STOP signal	black 2
1	STOP signal	black 1
PE loop M4	protective conduit	green-yellow

APPENDIX 2.3.9. WIRING OF BOX FOR SWITCHING OF PUMPS XP13 (ADBLUE®)



Output

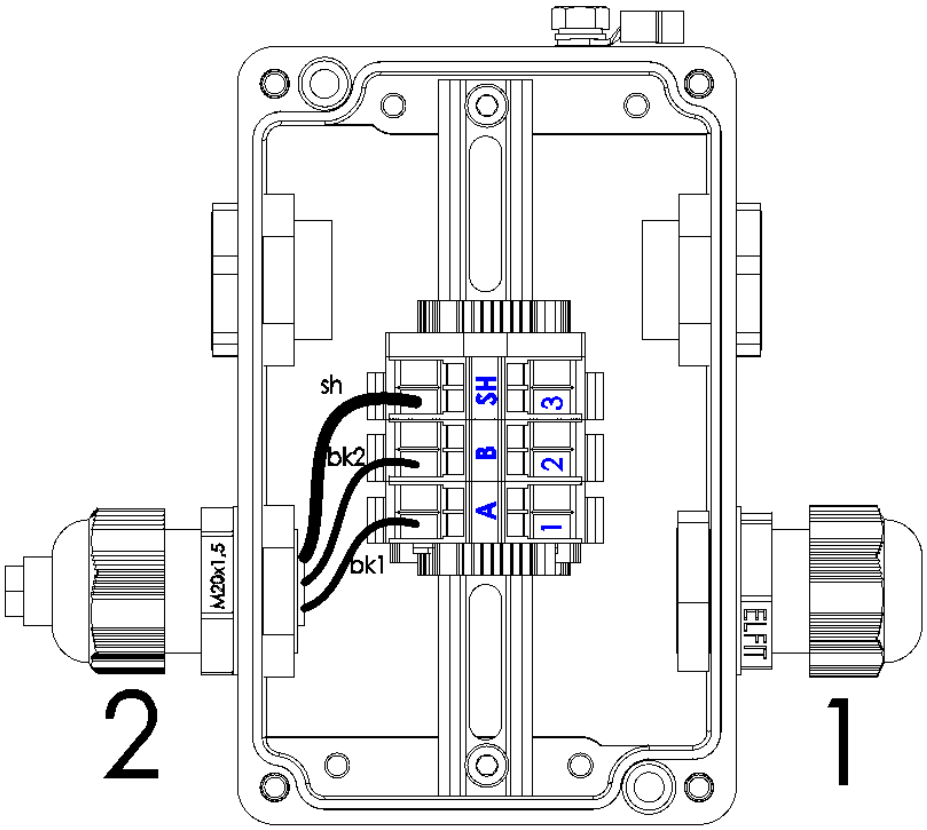
2	**Cable for switching of fuel and AdBlue® pumps** Type: H05VV5-F 7x1.5 Wiring: XP11 <---> dispenser counter box	
SC	shared conduit	black 6
S5	switched phase 5	black 5
S4	switched phase 4	black 4
S3	switched phase 3	black 3
S2	switched phase 2	black 2
S1	switched phase 1	black 1
PE loop M4	protective conduit	green-yellow

Input

1	**Cable for switching of fuel and AdBlue® pumps** Type: H05VV5-F 7x1.5 Wiring: XP11 <---> station distribution box	
6	shared conduit	black 6
5	switched phase 5	black 5
4	switched phase 4	black 4
3	switched phase 3	black 3
2	switched phase 2	black 2
1	switched phase 1	black 1
PE loop M4	protective conduit	green-yellow

Note: *The last of the used switching phases is designated for AdBlue®*

APPENDIX 2.3.10. WIRING OF DATA DISTRIBUTION BOX XS01



Output

2	**Communication cable for data line (PDE line)** Type: H05VVC4V5-K 2x0.5 Wiring: XS01 <---> dispenser counter box	
SH	shielding	SH
B	signal B	B
A	signal A	A

Input

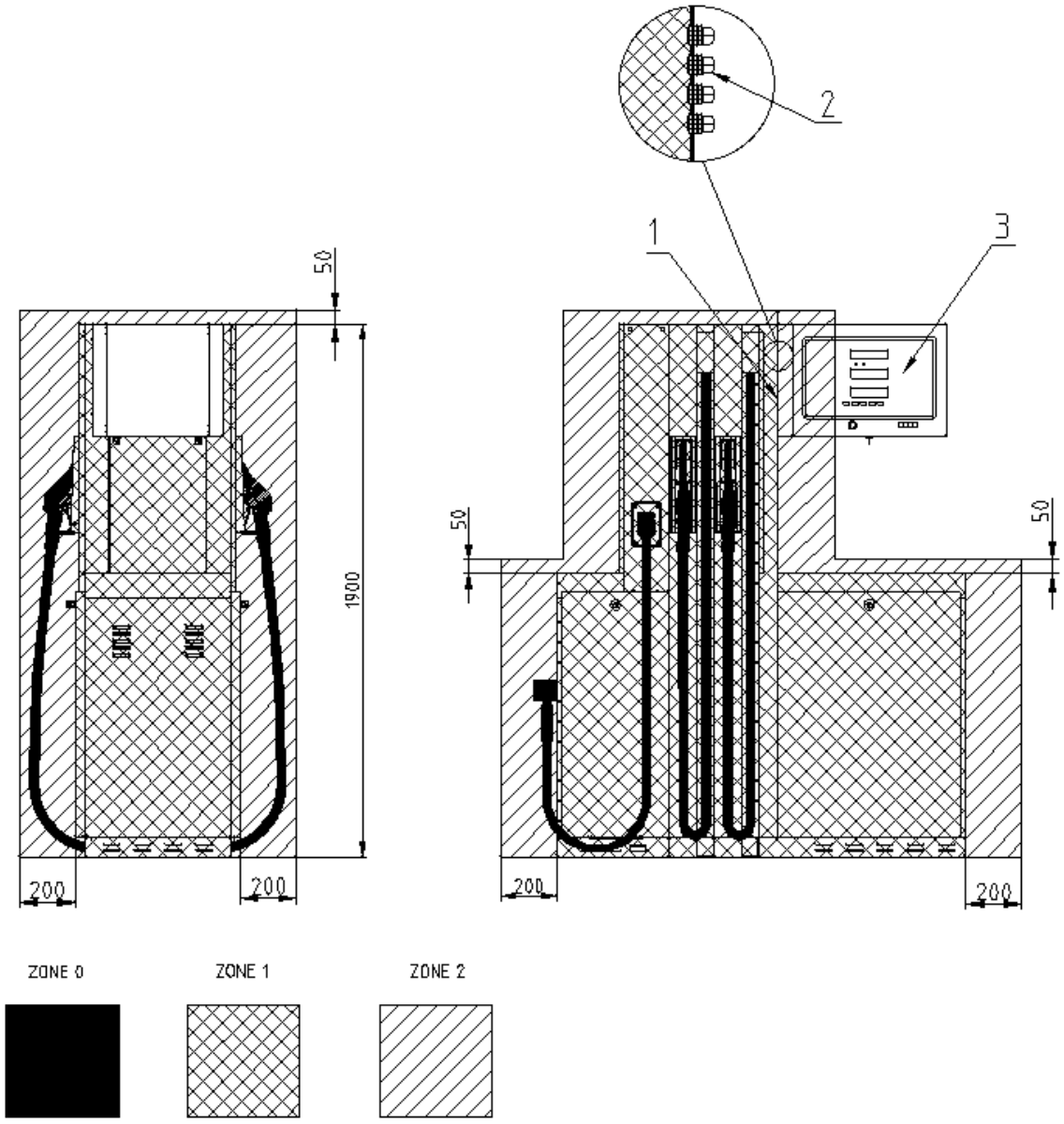
1	**Communication cable for data line** Type: H05VVC4V5-K 5x0.5 (recommended) Wiring: XS01 <---> kiosk – service point	
3	shielding	shielding (sh)
2	signal B	black 2 (bk2)
1	signal A	black 1 (bk1)
-	backup	black 3
-	backup	black 4
-	backup	black 5

NOTE *All distribution boxes RK003/6 and RK002/6 are in the model Ex II 2G Ex e II T6 Gb and have been issued with European Type Certificates FTZÚ12ATEX0152 and FTZÚ02ATEX0021. The maximum load of one connecting pin is 2A/550V with conduit cross-section 0.5 mm^2 or 12A/550V with cross-section 2.5 mm^2. The allowed cross-sections of conduits are between 0.5 and 2.5 mm^2. The length of the uninsulated part of the conduit is min. 9 mm and max. 10 mm. Cable glands M12 x 1.5, M16 x 1.5 or M20 x 1.5 are in the model IP66/68. The description of the connector in the data distribution box depends on the type of the data line. A data line with the PDE protocol is used as a standard.*

APPENDIX 3 – DEFINING THE EX ZONES ACCORDING TO EN 13617-1 A EN 60079-10-1

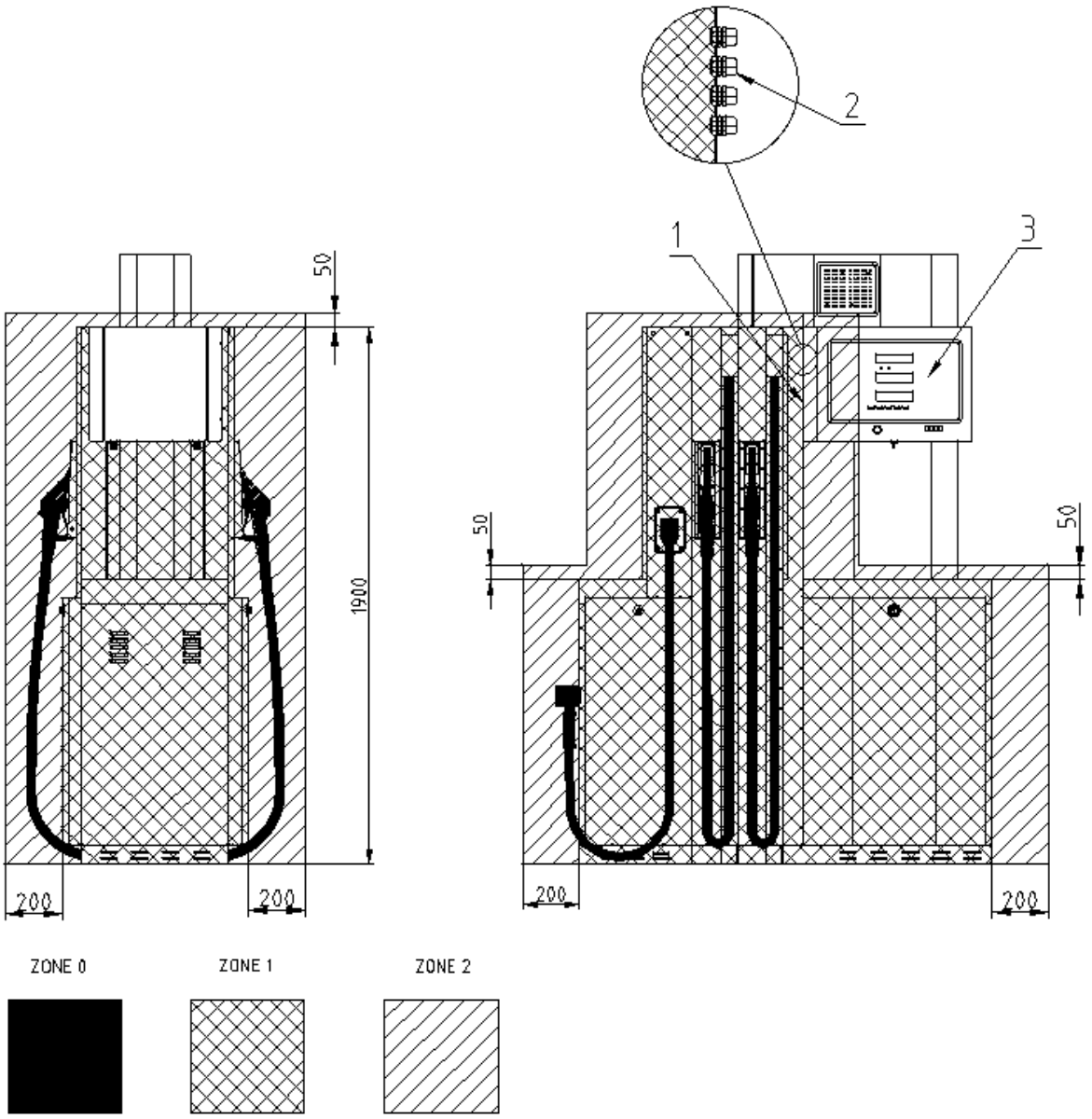
APPENDIX 3.1. – EX ZONES OF COMBINED DISPENSER OCEAN EURO WITH LPG MODULE

APPENDIX 3.1.1. EX ZONES OF DISPENSER WITH LPG MODULE IN BASE MODEL



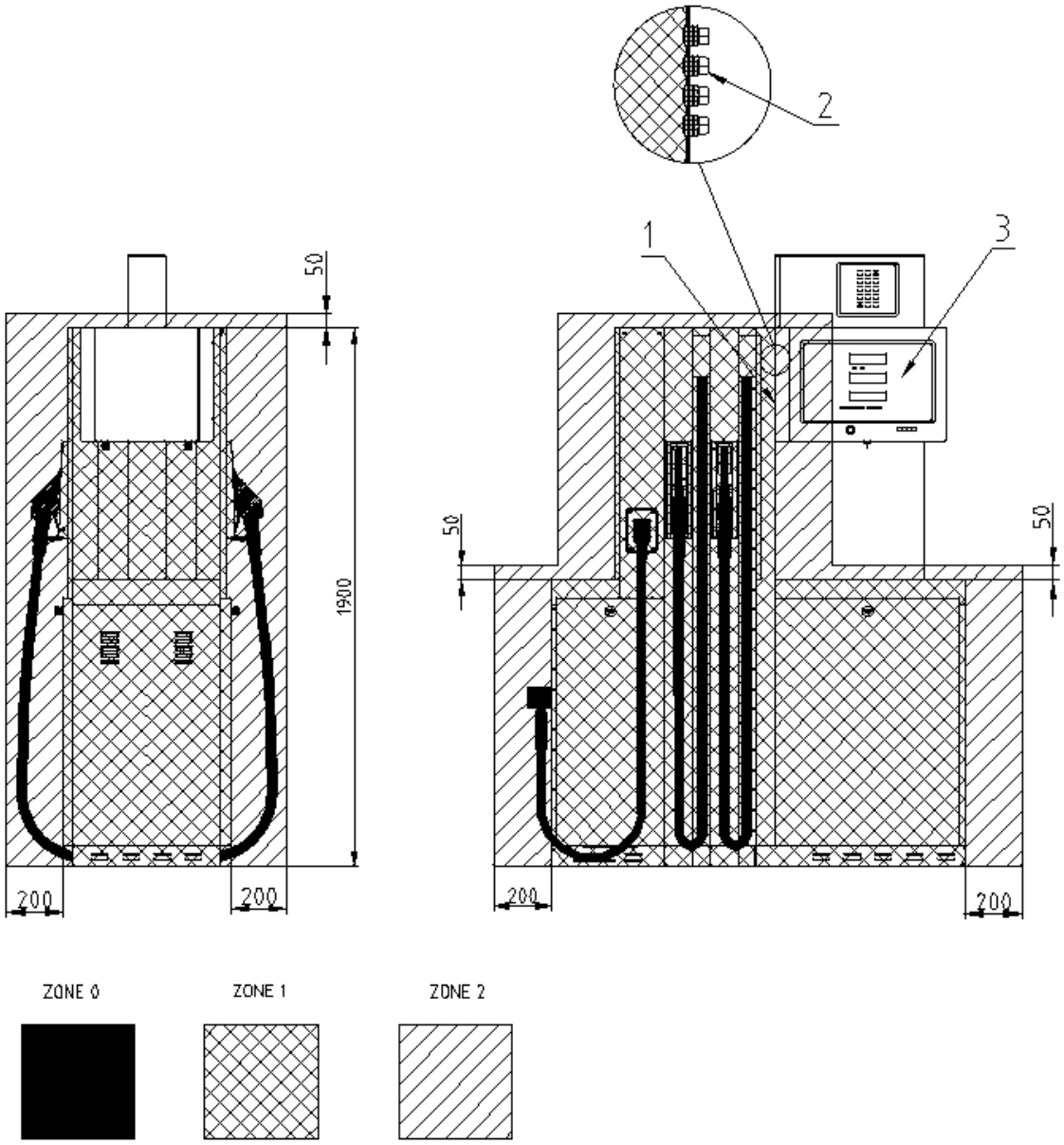
Pos.	Popis/*Description*	Pos.	Popis/*Description*
1	Vertikální přepážka - typ 1 (detail) *Vertical vapor barrier - type 1 (according EN 13 617-1)*	3	Prostor bez nebezpečí výbuchu (IP54) *Non-hazardous area (IP54)*
2	Nevýbušná kabelová vývodka Ex e II (IP67) *Cable bushing Ex e II (IP67)*		

APPENDIX 3.1.2. EX ZONES OF DISPENSER WITH LPG MODULE IN WAVE MODEL



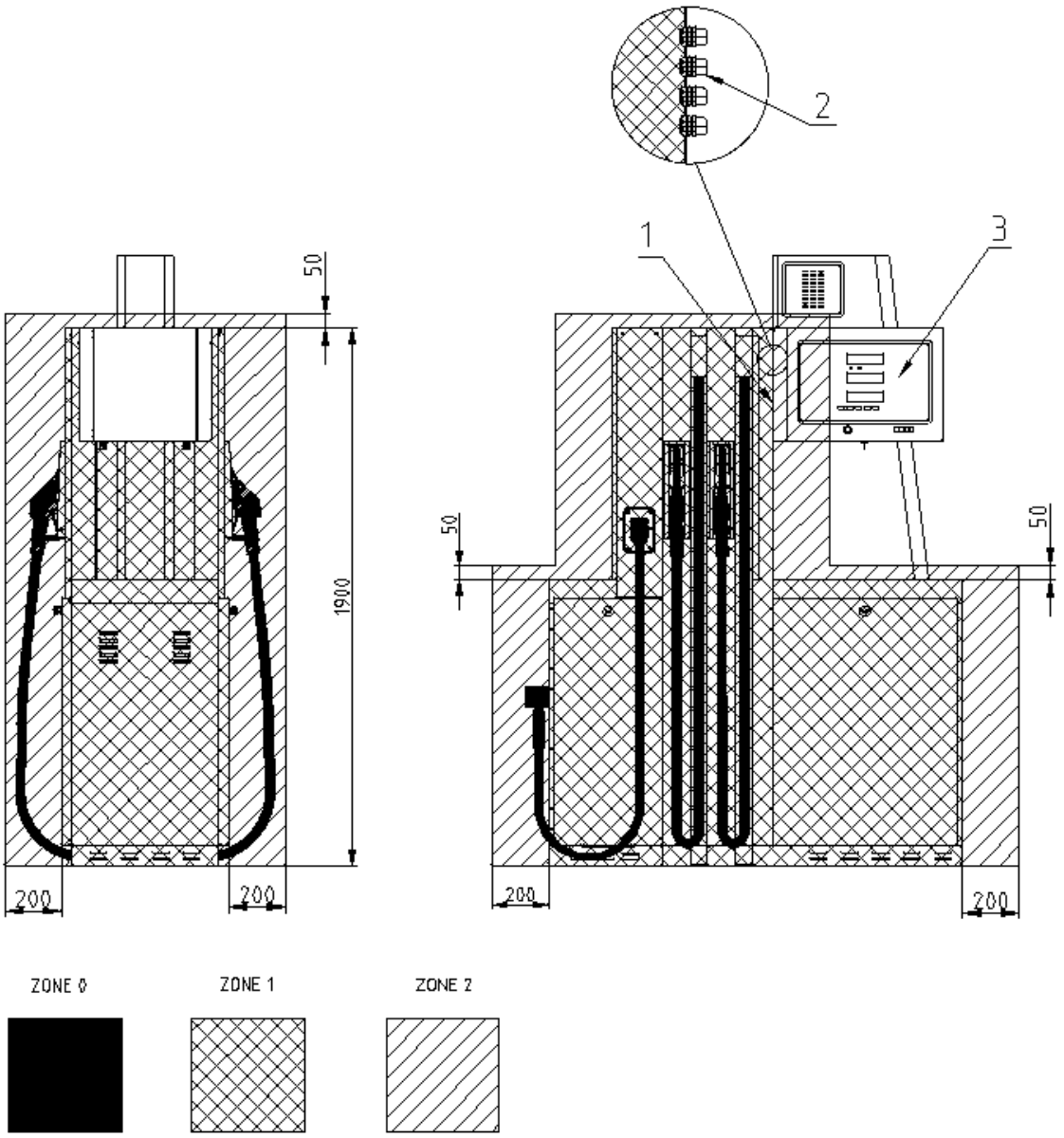
Pos.	Popis/*Description*	Pos.	Popis/*Description*
1	Vertikální přepážka - typ 1 (detail) *Vertical vapor barrier - type 1 (according EN 13 617-1)*	3	Prostor bez nebezpečí výbuchu (IP54) *Non-hazardous area (IP54)*
2	Nevýbušná kabelová vývodka Ex e II (IP67) *Cable bushing Ex e II (IP67)*		

APPENDIX 3.1.3. EX ZONES OF DISPENSER WITH LPG MODULE IN CUBE MODEL



Pos.	Popis/*Description*	Pos.	Popis/*Description*
1	Vertikální přepážka - typ 1 (detail) *Vertical vapor barrier - type 1 (according EN 13 617-1)*	3	Prostor bez nebezpečí výbuchu (IP54) *Non-hazardous area (IP54)*
2	Nevýbušná kabelová vývodka Ex e II (IP67) *Cable bushing Ex e II (IP67)*		

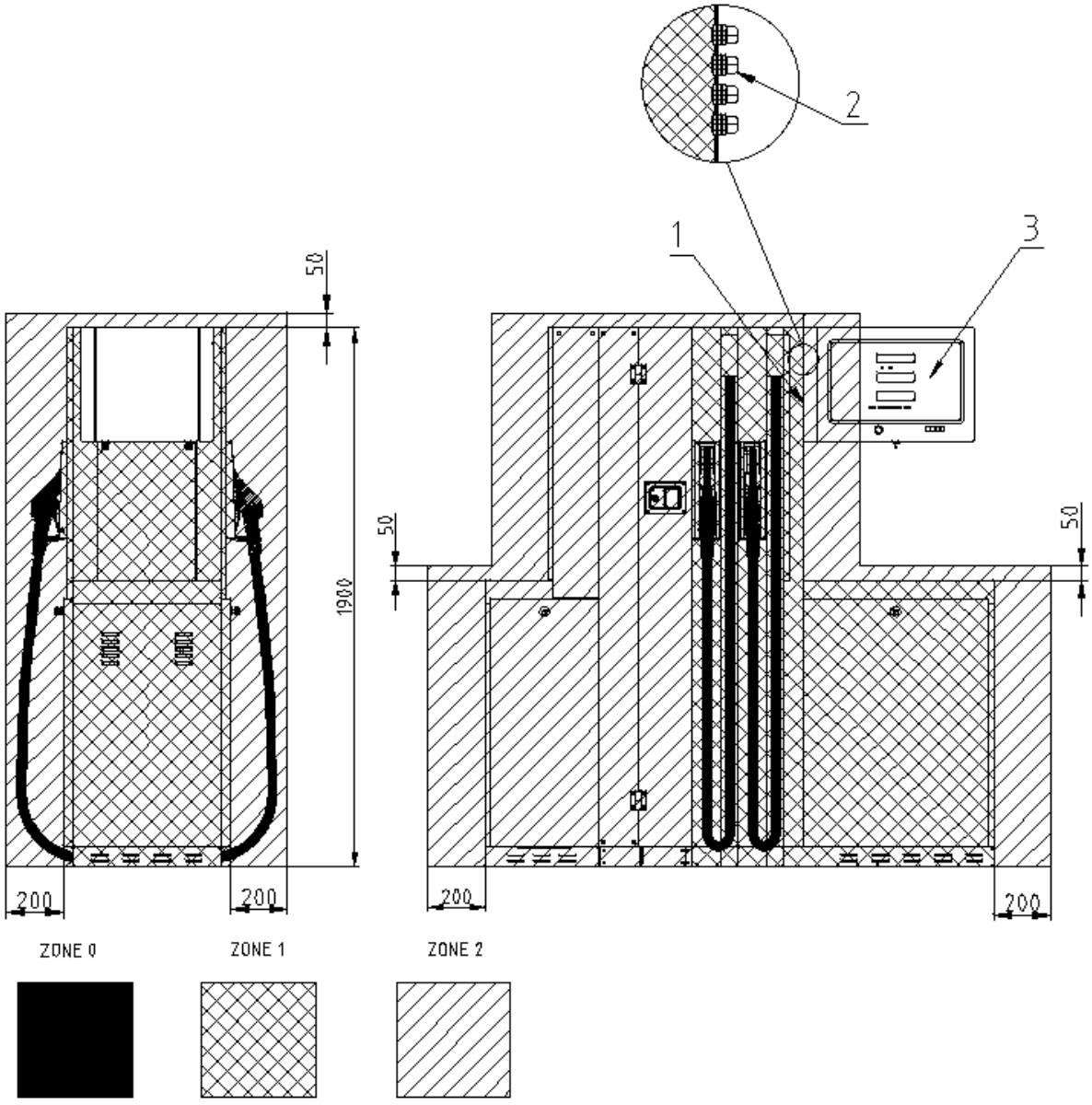
APPENDIX 3.1.4. EX ZONES OF DISPENSER WITH LPG MODULE IN FIN MODEL



Pos.	Popis/*Description*	Pos.	Popis/*Description*
1	Vertikální přepážka - typ 1 (detail) *Vertical vapor barrier - type 1 (according EN 13 617-1)*	3	Prostor bez nebezpečí výbuchu (IP54) *Non-hazardous area (IP54)*
2	Nevýbušná kabelová vývodka Ex e II (IP67) *Cable bushing Ex e II (IP67)*		

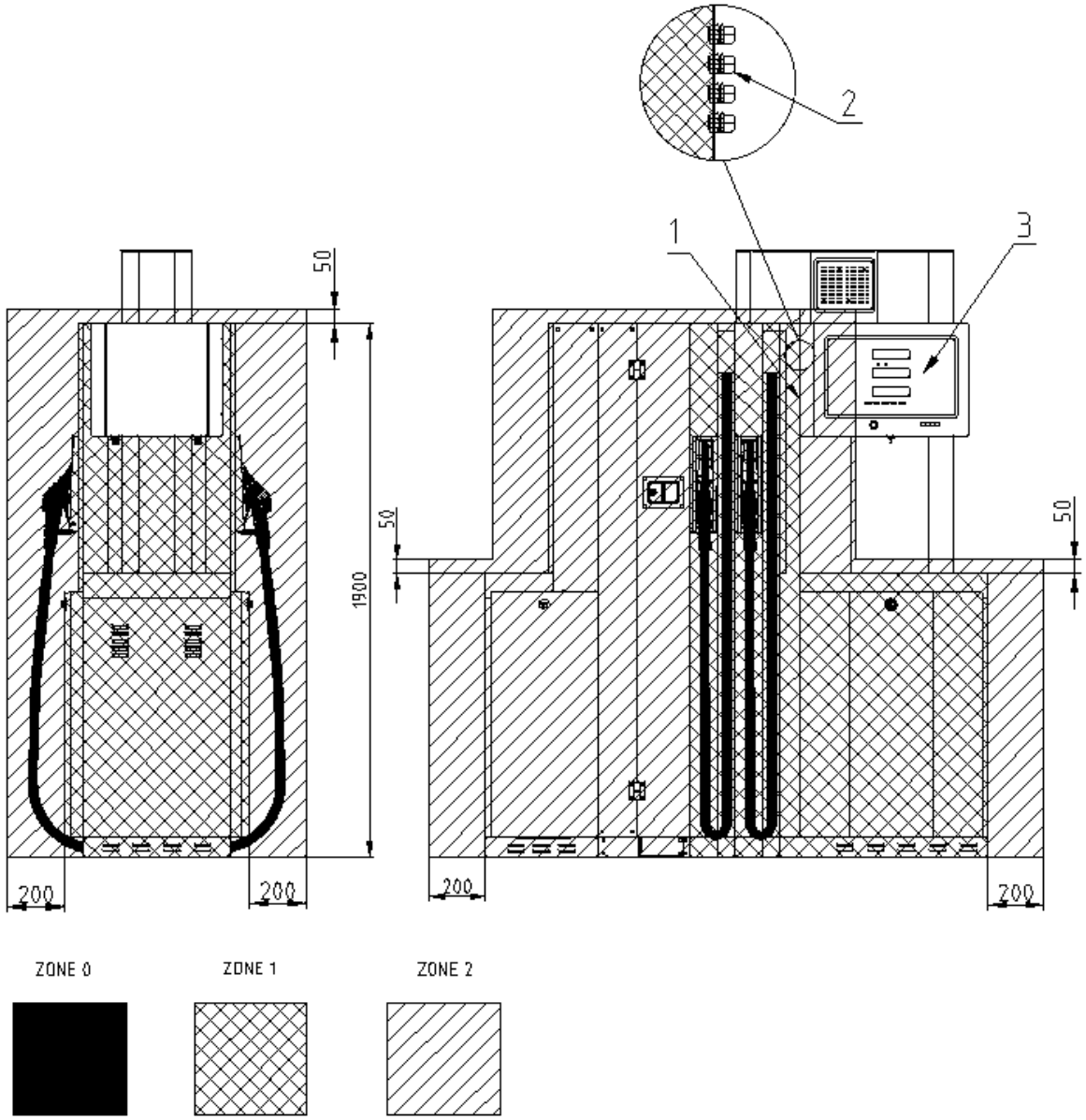
APPENDIX 3.2. – EX ZONES OF COMBINED DISPENSER OCEAN EURO WITH ADBLUE® MODULE

APPENDIX 3.2.1. EX ZONES OF DISPENSER WITH ADBLUE® MODULE IN BASE MODEL



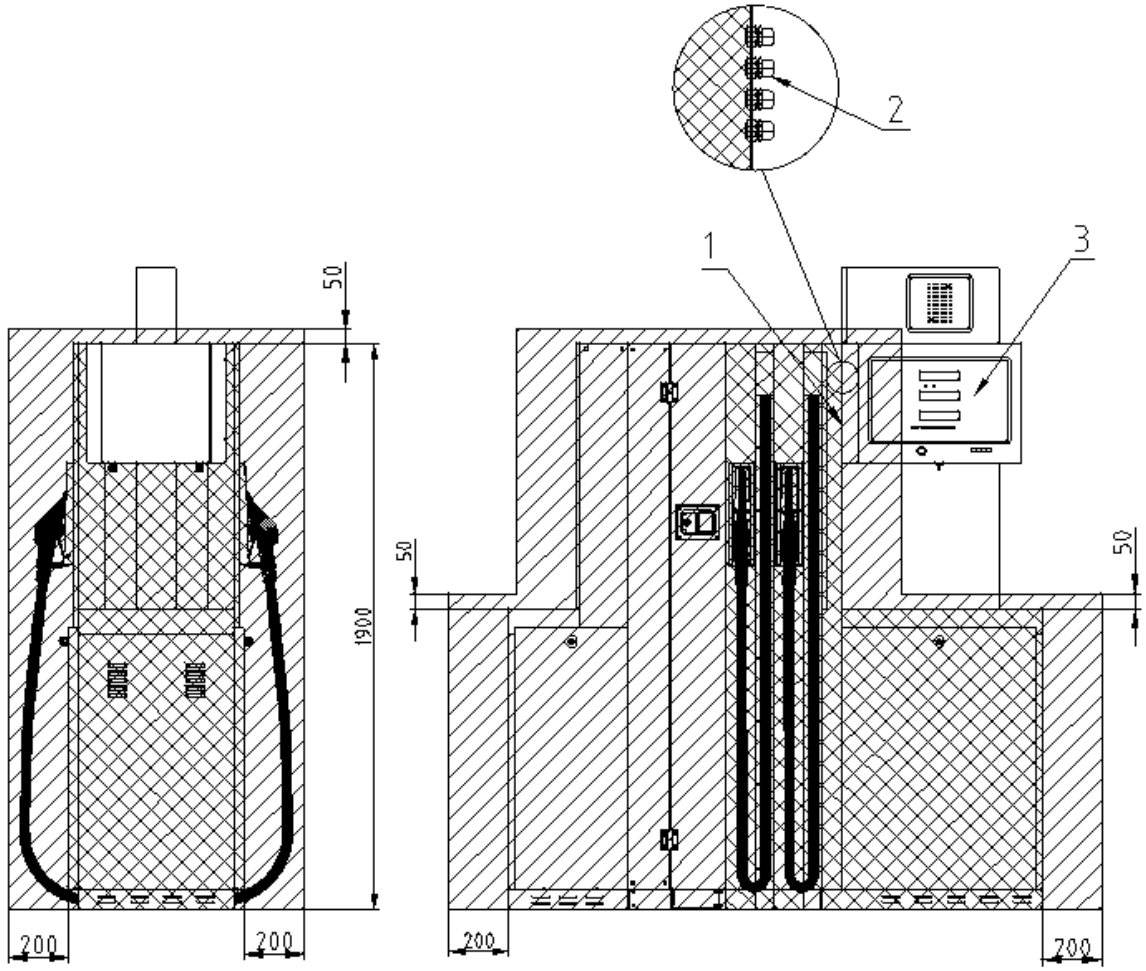
Pos.	Popis/*Description*	Pos.	Popis/*Description*
1	Vertikální přepážka - typ 1 (detail) *Vertical vapor barrier - type 1 (according EN 13 617-1)*	3	Prostor bez nebezpečí výbuchu (IP54) *Non-hazardous area (IP54)*
2	Nevýbušná kabelová vývodka Ex e II (IP67) *Cable bushing Ex e II (IP67)*		

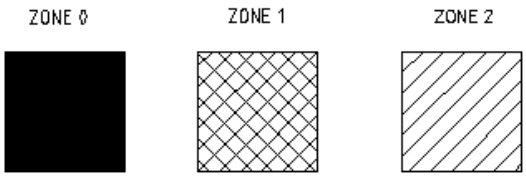
APPENDIX 3.2.2. EX ZONES OF DISPENSER WITH ADBLUE® MODULE IN WAVE MODEL



Pos.	Popis/*Description*	Pos.	Popis/*Description*
1	Vertikální přepážka - typ 1 (detail) *Vertical vapor barrier - type 1 (according EN 13 617-1)*	3	Prostor bez nebezpečí výbuchu (IP54) *Non-hazardous area (IP54)*
2	Nevýbušná kabelová vývodka Ex e II (IP67) *Cable bushing Ex e II (IP67)*		

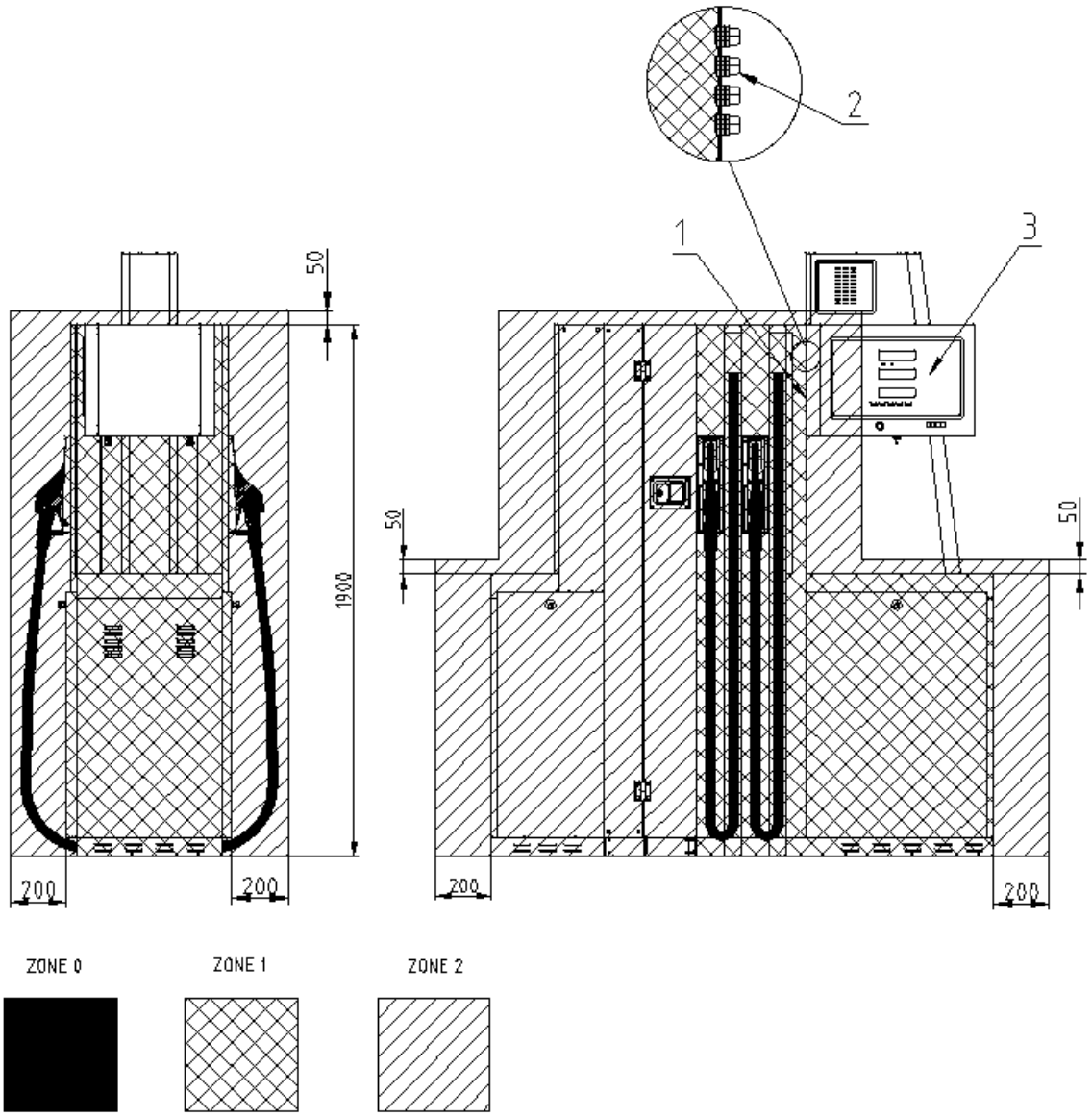
APPENDIX 3.2.3. EX ZONES OF DISPENSER WITH ADBLUE® MODULE IN CUBE MODEL





Pos.	Popis/*Description*	Pos.	Popis/*Description*
1	Vertikální přepážka - typ 1 (detail) *Vertical vapor barrier - type 1 (according EN 13 617-1)*	3	Prostor bez nebezpečí výbuchu (IP54) *Non-hazardous area (IP54)*
2	Nevýbušná kabelová vývodka Ex e II (IP67) *Cable bushing Ex e II (IP67)*		

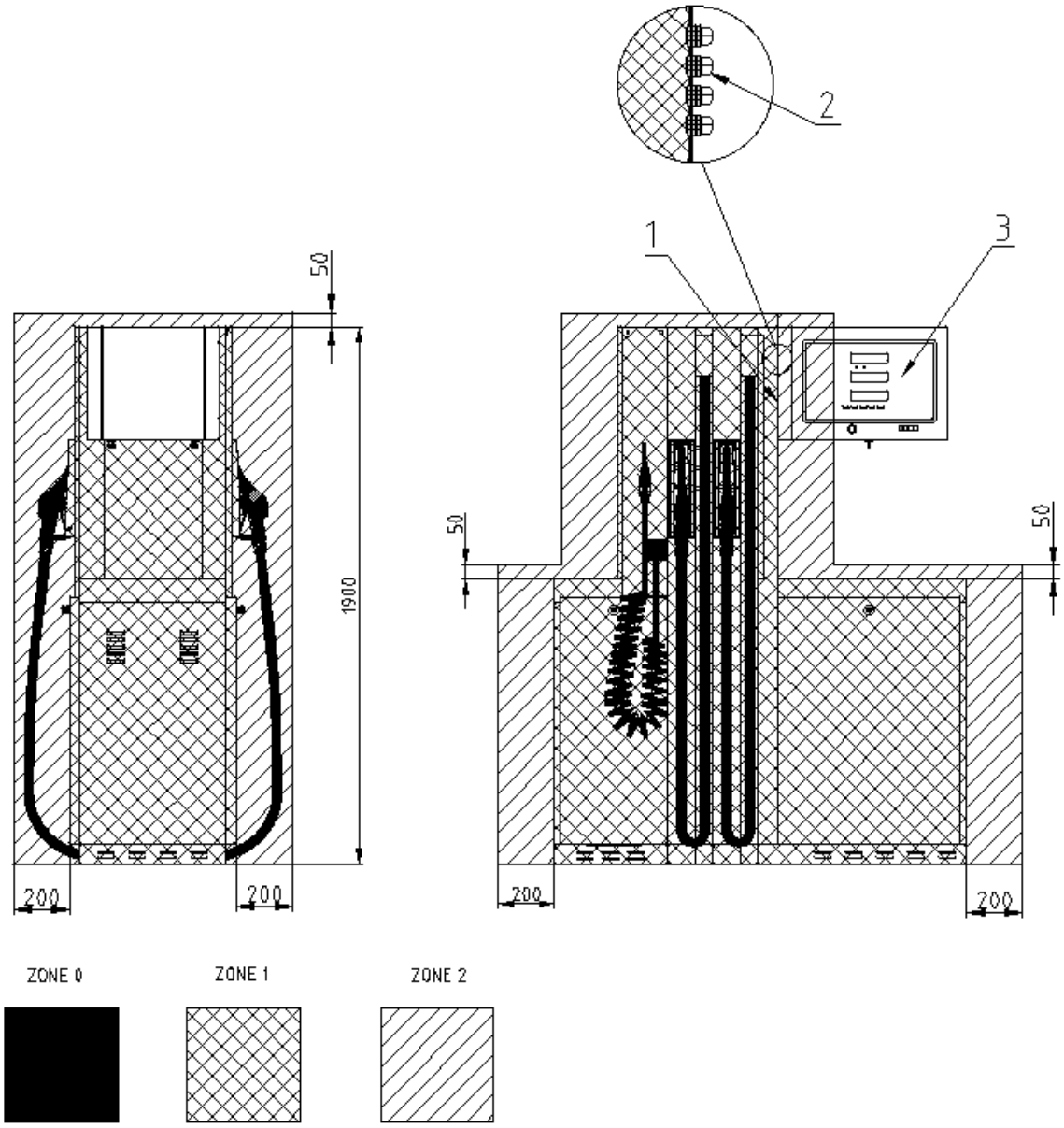
APPENDIX 3.2.4. EX ZONES OF DISPENSER WITH ADBLUE® MODULE IN FIN MODEL



Pos.	Popis/*Description*	Pos.	Popis/*Description*
1	Vertikální přepážka - typ 1 (detail) *Vertical vapor barrier - type 1 (according EN 13 617-1)*	3	Prostor bez nebezpečí výbuchu (IP54) *Non-hazardous area (IP54)*
2	Nevýbušná kabelová vývodka Ex e II (IP67) *Cable bushing Ex e II (IP67)*		

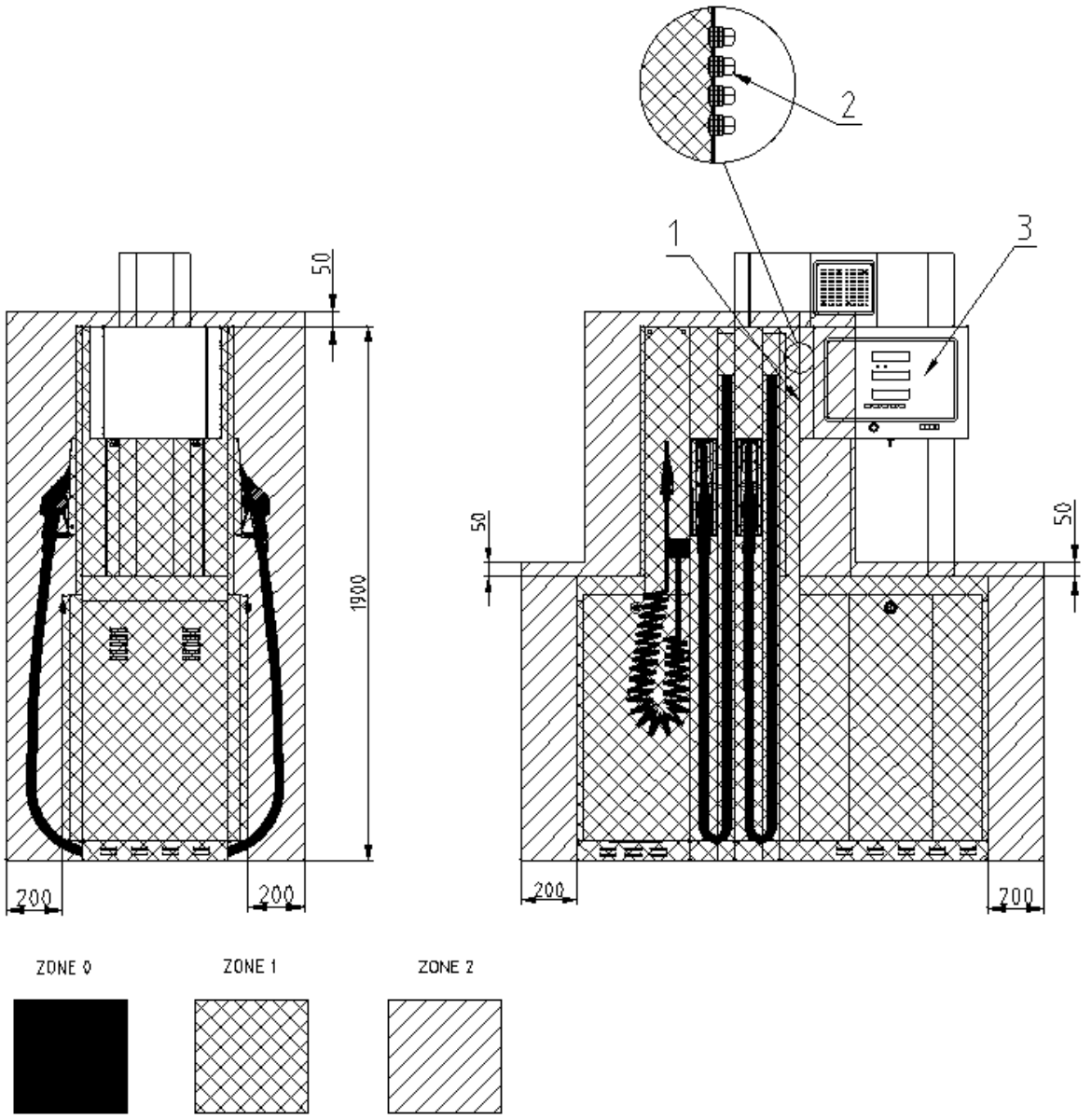
APPENDIX 3.3. – EX ZONES OF COMBINED DISPENSER OCEAN EURO WITH WSE MODULE

APPENDIX 3.3.1. EX ZONES OF DISPENSER WITH WSE MODULE IN BASE MODEL



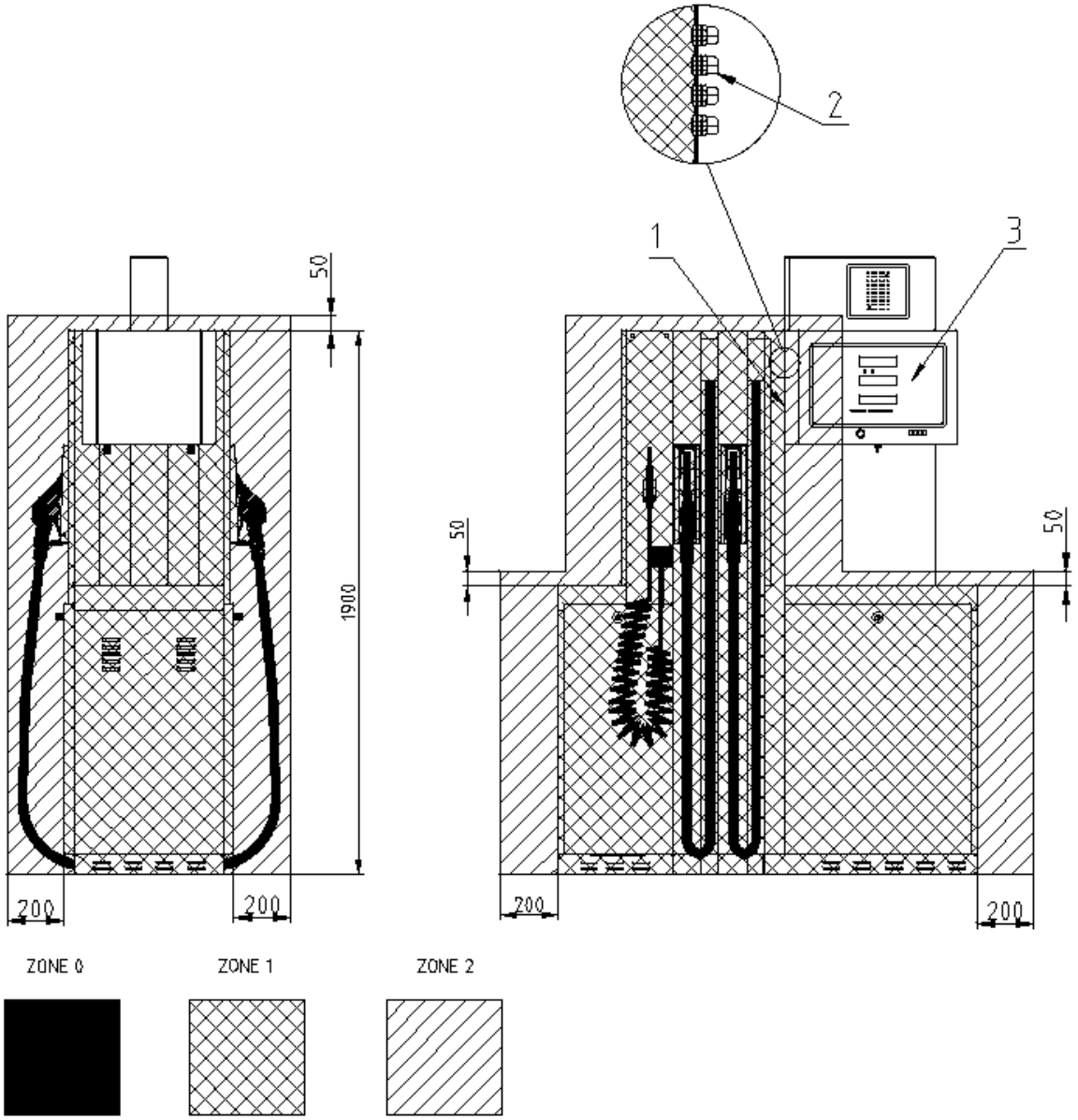
Pos.	Popis/*Description*	Pos.	Popis/*Description*
1	Vertikální přepážka - typ 1 (detail) *Vertical vapor barrier - type 1 (according EN 13 617-1)*	3	Prostor bez nebezpečí výbuchu (IP54) *Non-hazardous area (IP54)*
2	Nevýbušná kabelová vývodka Ex e II (IP67) *Cable bushing Ex e II (IP67)*		

APPENDIX 3.3.2. EX ZONES OF DISPENSER WITH WSE MODULE IN WAVE MODEL



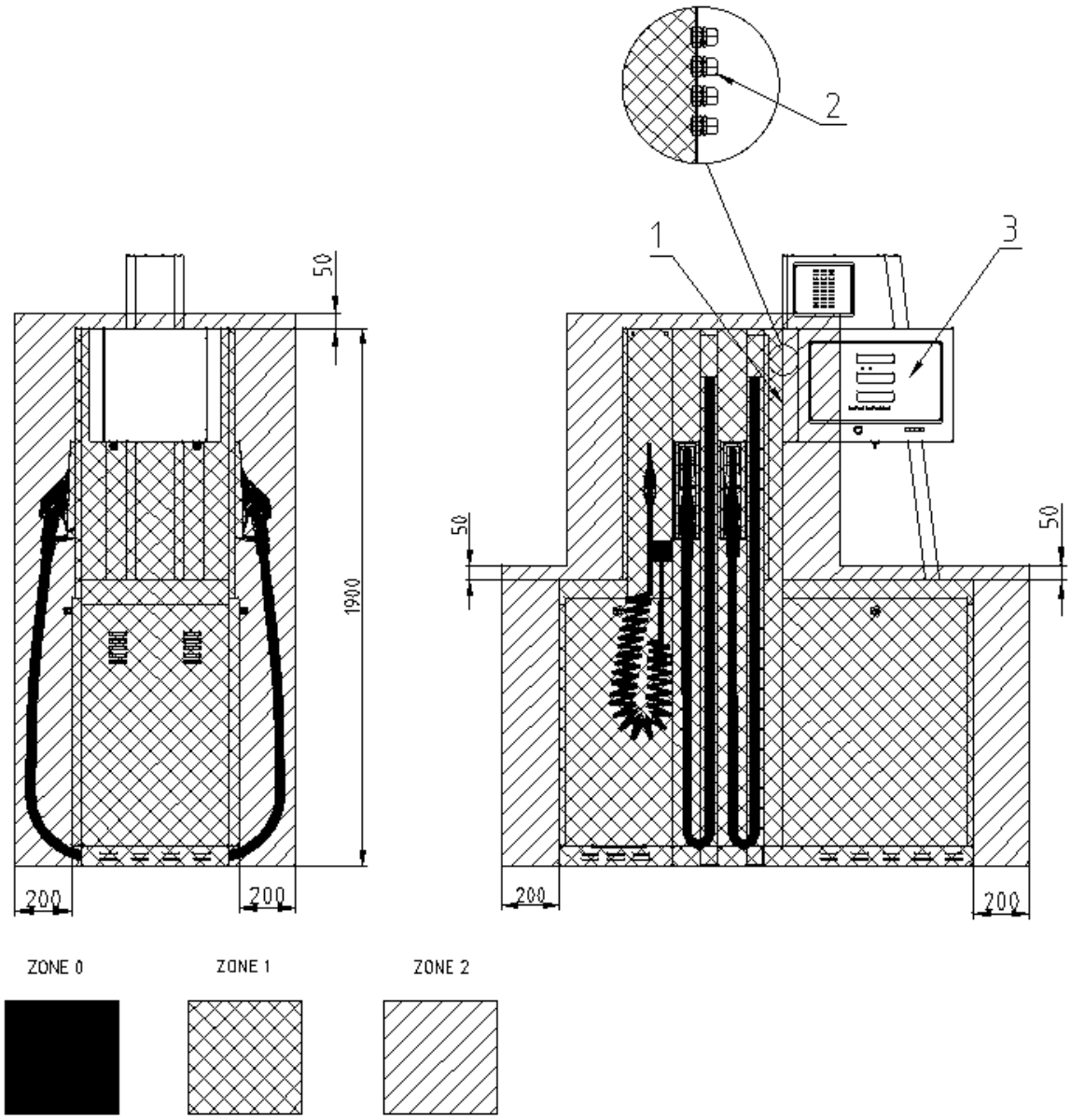
Pos.	Popis/*Description*	Pos.	Popis/*Description*
1	Vertikální přepážka - typ 1 (detail) *Vertical vapor barrier - type 1 (according EN 13 617-1)*	3	Prostor bez nebezpečí výbuchu (IP54) *Non-hazardous area (IP54)*
2	Nevýbušná kabelová vývodka Ex e II (IP67) *Cable bushing Ex e II (IP67)*		

APPENDIX 3.3.3. EX ZONES OF DISPENSER WITH WSE MODULE IN CUBE MODEL



Pos.	Popis/*Description*	Pos.	Popis/*Description*
1	Vertikální přepážka - typ 1 (detail) *Vertical vapor barrier - type 1 (according EN 13 617-1)*	3	Prostor bez nebezpečí výbuchu (IP54) *Non-hazardous area (IP54)*
2	Nevýbušná kabelová vývodka Ex e II (IP67) *Cable bushing Ex e II (IP67)*		

APPENDIX 3.3.4. EX ZONES OF DISPENSER WITH WSE MODULE IN FIN MODEL



Pos.	Popis/*Description*	Pos.	Popis/*Description*
1	Vertikální přepážka - typ 1 (detail) *Vertical vapor barrier - type 1 (according EN 13 617-1)*	3	Prostor bez nebezpečí výbuchu (IP54) *Non-hazardous area (IP54)*
2	Nevýbušná kabelová vývodka Ex e II (IP67) *Cable bushing Ex e II (IP67)*		

Notes